RAILROAD GAZETTE

FRIDAY, OCTOBER 27, 1899.

## CONTENTS.


| ILLUSTRATIONS: | PAGE |
|---|---|
| An Inspirator Fixed to the Boiler Head | 741 |
| Two Locomotive Designs | 742 |
| Cooke Locomotive for the Barry Railway, South Wales | 743 |
| Spout for Water Cranes | 743 |
| A New Tie Adzing Machine | 745 |
| **CONTRIBUTIONS:** | |
| Bridge Building—A Correction | 739 |
| A Good Day's Work | 739 |
| Handling Trains Partly Equipped with Air | 739 |
| That Bridge for Burma | 739 |
| The Friction Buffer | 739 |
| **EDITORIALS:** | |
| The Limits of the Size of a Locomotive | 746 |
| Some Notes of Experience with Rails | 747 |
| Locomotive Building in Great Britain | 747 |
| **EDITORIAL NOTES** | 746, 747 |
| **GENERAL NEWS:** | |
| Locomotive Building | 749 |
| Car Building | 750 |
| Bridge Building | 750 |
| Meetings and Announcements | 751 |
| Personal | 752 |
| Elections and Appointments | 752 |
| Railroad Construction | 753 |
| General Railroad News | 754 |
| Traffic | 754 |
| **MISCELLANEOUS:** | |
| Technical | 748 |
| The Scrap Heap | 748 |
| Bridge and Building Superintendents | 739 |
| The Federal Industrial Commission | 741 |
| Notes on Electric Motors in Railroad Service | 741 |
| American Street Railway Association Annual Convention | 742 |
| Some Unrecognized Functions of Our State Universities | 743 |
| Pumping Engines for Water Stations | 744 |
| An English Opinion of American Freight Couplers | 745 |
| Foreign Railroad Notes | 745 |


## Contributions.

### Bridge Building.—A Correction.

New York, Oct. 20, 1899.

To the Editor of the Railroad Gazette:

In your issue of October 20, under "Bridge Building," you state that "we failed to carry out our contract to build a bridge over the Pennsylvania Railroad tracks in Jersey City." On the face of this statement, it would appear that we were unable, or unwilling, to do the work. Such is not the case. The reason we have given it up is because the County discovered that they were unable to make a contract at this time.

F. R. LONG COMPANY.

[Our way of putting the matter was pure stupidity. There is no excuse for it.—Editor Railroad Gazette.]

### A Good Day's Work.

Detroit, Oct. 23, 1899.

To the Editor of the Railroad Gazette:

The Flint & Pere Marquette Railroad Company had a piece of track to take up, and to avoid some legal complications it was decided to do the whole job, about 8 miles, on Sunday, the 15th inst. No spikes or bolts were loosened before that day, nor was the dirt, which covered the ties badly in many cuts and at the log railways, removed. In eight hours, between 8.20 a. m. and 5 p. m., one gang of men picked up and put over the end of the train 6½ miles of 56-lb. rails and two side tracks. All frogs, switches, spikes, bolts and plates were picked up clean and loaded. No machinery was used for this purpose except some hastily constructed rollers on the cars to run the rails over. Do you know of any one who has done better? A total of 230 men were employed.

INQUIRER.

### Handling Trains Partly Equipped with Air.

Washington, D. C.,
Oct. 20, 1899.

To the Editor of the Railroad Gazette:

I was interested in reading your editorial, first column, page 694, of the October 6th issue, on the subject of handling trains partially equipped with air brakes, when taken in connection with the article on the same subject on page 689, in which the report of Mr. C. L. Nichols of the Rock Island road is given. In this connection you also quote Mr. Kidder's remarks made at the Air Brake Men's Association meeting.

As a matter of fact, it is a physical impossibility to handle freight trains as Mr. Nichols says they do on his road, and from all the information I can get the absence of accidents from so doing is merely due to the disobedience of orders by trainmen in ignoring the instructions issued by the Rock Island management.

INSPECTOR.

### That Bridge for Burma.

The Pennsylvania Steel Company,
Steelton, Pa., Oct. 21, 1899.

To the Editor of the Railroad Gazette:

Answering your inquiry; the trestle we are building in Burma is about 100 miles or so above Mandalay and is 2,260 ft. long and 320 ft. deep from base of rail to top of masonry at its deepest point. The columns and bracing are designed for a double track railroad, though we are only providing girders at this time for one track. The gorge over which the railroad is carried is called the Gokteik gorge and is dry, that is, no water runs on the surface of the ground, but the stream goes through a natural tunnel 500 ft. below the foundations.

We have the shop work nearly completed and have made two shipments; the first shipment consisted of 90 cars of material and the second shipment about 60 cars. The third shipment will go next month. Messrs. Norton & Son of New York are carrying the material from New York City direct to Rangoon in their steamers. We suppose the first boat will arrive very shortly, if it has not already arrived at Rangoon.

L. E. J.

### The Friction Buffer.

Chicago, Oct. 23, 1899.

To the Editor of the Railroad Gazette:

Your article on "Metal Draft Beams" (issue of Oct. 13) and the letter of Mr. Westinghouse last week, bring up one of the most interesting subjects connected with freight car details. As you probably know, a committee of the M. C. B. Association is expected to report at the next meeting on "Draft Gear," and show, if possible, how the present recommended practice can be altered to provide greater strength. But I am strongly of the opinion that an adequate design cannot be made along the lines of the present M. C. B. recommended practice. Probably what is needed most at this time is definite information as to the strength of the present draft rigging, and what additional strength and spring capacity are required. One thing is certain, the common draft gear will not withstand the M. C. B. test prescribed for couplers.

I am particularly interested in the tests which Mr. Westinghouse briefly mentions, and am curious to know how they were made. This promises to be of so much importance that a full account should be published, but if there are reasons why this cannot be done at this time, let us know at least about the following points: Were the tests made under a falling weight; and, if so, what was the weight of the drop and the distance through which it fell? How were the measurements taken, and is it known (if the experiments were made on a drop testing machine) what relation these trials bear to cars meeting in service? That is, what weight car, moving at what speed, and meeting a car at rest, would be equivalent to the test noted. What was the condition of the "Standard" draft gear after the test? I trust, however, you will be able to give us a full description of the trials rather than concise answers to these particular questions.

X.

### Bridge and Building Superintendents.

The ninth annual meeting of the Association of Railroad Superintendents of Bridges and Buildings was held at the Cadillac Hotel, Detroit, Mich., October 17 and 18. The meeting was opened with an address by Mr. W. C. Maybury, the Mayor of Detroit. The roll call showed 28 members present, and 16 new members were elected. The President made an informal address calling attention to the increased business in all branches of railroad service, which had prevented many members from attending the meeting. The Secretary reported a total membership of 164. The receipts during the past year had exceeded the disbursements by $216.

At the afternoon session the reports of five committees were presented. Four committees failed to report, and two of the subjects were postponed to next year, viz.: "The Tool Equipment of a Gang of Bridge Men," and "The Best Snow Fence; Stationary or Portable."

The reports presented at the last meeting and printed in the Proceedings were then brought up for further discussion. Regarding smoke jacks for round houses, Mr. A. S. Markley (C. & E. I.) said he was firmly convinced that the best smoke jacks were those made of unpainted wood; it was unnecessary to paint the inside, as after a short time the soot and moisture formed a thick coating that is practically fireproof. During four years none of his wooden jacks have taken fire. They are made circular in cross-section, as illustrated in last year's Proceedings, the several parts being fastened together with wooden dowel pins. Vitrified pipe, in use eight years, is found badly deteriorated by the action of the gases, and in many instances cracked. This latter statement was confirmed by the experience of Mr. B. F. Pickering (B. & M.) and Mr. A. E. Killam (Intercolonial). Some members preferred a wooden smoke jack of square section put together with copper nails or brass screws.

With reference to protecting metal bridges from salt-water drippings from refrigerator cars, Mr. M. Riney (C. & N. W.) stated that there was no trouble from this source provided the bridge floors were kept painted. Mr. W. A. Rogers (C., M. & St. P.) said the bridges over the streets at Chicago, where the tracks had been elevated, had tight floors and last year these floors were covered with asphalt; this, however, has not proved satisfactory, as the asphalt cracks and breaks away from the metal, and the coating is being removed. These floors are now being painted with nine different kinds of paint to determine which kind is the most suitable; floors left unpainted but a short time were badly corroded. Mr. A. Montzheimer (C. & N. W.) said that on similar bridges, at Chicago, his road had covered the floors with a mixture of tar and gravel, the joints between the plates being first caulked with hemp. This plan had not been used long enough to know surely whether it would prove satisfactory, but so far there was no indication of the floors being affected. The C. & N. W. experienced much trouble from the corrosion of the girders of overhead bridges from the acid fumes of locomotives. A viaduct built 15 years ago and painted every three or four years had holes in some places eaten clear through the webs of the girders. Mr. Rogers further said the St. Paul had recently taken down the viaduct at Western Avenue, Chicago, which was between 12 and 14 years old, and the sections were found reduced by corrosion from 10 to 12 per cent.

The question of the best construction for turntables brought out the statement from Mr. Markley (C. & E. I.) that some 66-ft. center-bearing tables of the Strobel * type, lately put in by his road, were superior to any he had used. Freight locomotives with 140,000 lbs. on the driving wheels were easily turned by two men, and one man often did the work. Some of these tables had been in use during severe winter weather, but had given no trouble. He thought it not worth while to equip turntables to be driven by power as long as it was possible to get turntables which one man could work. There would be no saving in labor in such cases, as one man would be required to operate the machinery, while the cost of the machinery would be additional. Some other members had had no experience with the Strobel turntables, and spoke favorably of various makes. Mr. T. M. Strain described a 70-ft. turntable on the Baltimore & Ohio Southwestern, which was so equipped with electric motors and a controlling device that the hostler after balancing the locomotive had only to press a button to set the machinery in motion; in that case there were no extra men required to work the turntable.

The freezing of stand pipes was briefly discussed, and Mr. J. Stannard (Wabash) said a quick way to thaw out a frozen goose-neck, where water was taken directly from the tank, was to place the end of the goose-neck over the whistle [safety valve?] of the locomotive; the steam thawed the ice in a remarkably short time.

On Wednesday morning the order of business was the discussion of committee reports. The first report was, "The Most Economical Method of Painting," the committee being Messrs. A. Montzheimer, B. F. Pickering, H. D. Cleaveland and W. A. McGonagle. From replies to a circular letter it was learned that a number have used pneumatic paint spraying machines for buildings, others the air brush for painting and kalsomining, but only a few have obtained satisfactory results. On steel bridges other than plate girders the painting machines waste a great deal of paint. The committee held that air painting machines were new, and a certain amount of prejudice would have to be overcome before they came into general use. "As the machines are improved by experience and the men operating them understand them more thoroughly, we think painting machines will be extensively used on large buildings, having but few openings, and on some bridges. The sand blast also will become an important and successful agent in cleaning iron and steel work for painting." There was no agreement as to the best kinds of paint to use for bridges and buildings.

The discussion was opened by Mr. A. Montzheimer, who described an apparatus used in car shops for feeding paint to the brush. This consisted of a cylindrical tank about 2 ft. long and 10 in. in diameter, having a capacity of about 10 gallons. This tank was connected to a flat brush with a 4 ft. flexible tube, and by means of a small hand pump the air pressure in the tank was made sufficient to force the paint through the tube. The workman had only to rub the brush on the surface to be painted. Mr. Pickering said, with so large a tank the paint would settle, and as a man could not work continuously the brush would become clogged. He did not think favorably of the scheme. Mr. Killman said the work he had seen done with paint spraying machines on freight cars was so uneven that the cars had to be finished with a brush. It was suited to white-washing shop buildings, but where so used the machinery and floors were always badly spattered. Mr. J. M. Staten said the Chesapeake & Ohio had abandoned the use of spraying machines in freight car painting. Mr. T. M. Strain (Wabash) described the painting with spray machines of the Twelfth Street Viaduct, Chicago, by the Atchison, Topeka & Santa Fe. The whole neighborhood was painted and he had been obliged to send men to clean the Wabash freight house extending between Twelfth and Fourteenth Streets. The work on the viaduct was uneven and looked bad.

Mr. Pickering favored machine painting. At the Concord shops of the Boston & Maine these machines are worked successfully. With expert operators, he said, there need be no more paint wasted than when brushes are used. With the spray one man can paint

* For complete illustrated description see Railroad Gazette April 1, 1898, page 231.

a box car in 20 minutes, no brush work being done; the same work done by hand takes two men five hours, and the same amount of material is used in both cases. The workmen do not like the painting machines, and claim the paint is inhaled, for which reason it has been impossible to get as good men to operate the machines as can be had to do hand work. The quality of the machine painting depends largely upon the skill of the operator, and Mr. Pickering thought the latest machines could be used to advantage even on truss bridges. They were not suitable for nice work, but were well adapted for painting all kinds of bridges, round houses, machine and car shops, out-buildings, etc. The cost of a portable painting outfit for such work was about $1,500. The paint used for machine work must be well ground and thoroughly strained before it is put in the machine. A heavy paint is found most suitable for machine painting and good results are obtained on the Boston & Maine with a mixture of nine parts of white lead and one part of graphite.

Mr. W. O. Eggleston (Chicago & Erie) said that road would soon have a portable machine painting outfit. A test was recently made to determine the cost of painting with pneumatic machines which included the painting of a round-house which was in very bad condition, a 16 x 24-ft. water tank mounted on a 30-ft. trestle, a station and a transfer house. The round-house had 5,900 sq. ft. of surface, and two coats of paint applied with machines cost $53.97; the water tank had 4,630 sq. ft. and one coat applied by hand cost $26.60, and one machine coat cost $20.51; the station had 3,100 sq. ft. of surface and two coats of machine painting cost $25.99, while similarly the transfer house with 1,440 sq. ft. of surface cost $14.30 for two coats of paint put on with the pneumatic sprayer.

The second report, "Life of Timber in Bridges and Protection of Timber from Weather," was made by Mr. B. W. Guppy (B. & M.), giving statistics of the life of piles and bridge timbers in different parts of this country.

### Bridge Timber.

Mr. B. W. Guppy reports as a committee on the life of different kinds of timber in bridges and the advisability of protecting timber from the weather. His report is confined entirely to answers to a circular of inquiry sent out. Oak for piles and long leaf Southern and white pine for framed timber are the varieties most in use for bridges. There is no question as to the advisability of protecting timber from the weather. Satisfactory methods for protecting stringer and trestle bridges have not yet been devised, but the housing of truss bridges is simple, and plates show the various methods used. Any method should provide for ventilation and inspection. The plates which accompany this report show:

A covering for a pony truss on the Chicago, Milwaukee & St. Paul Railway, which is rigged with movable panels to be fastened with screws at each panel point.

A covering for wooden deck truss on the Boston & Maine Railroad.

A covering for Howe truss deck bridges on the Chicago, Milwaukee & St. Paul. This has a trap-door in the decking over each set of rods, two boards in the upper and two in the lower covering fastened with screws.

A housing for through trusses on the Boston & Maine.

Covering for through Howe truss on the Chicago, Milwaukee & St. Paul with movable panels about four feet long in the roof at each panel point of the truss, these to be fastened with screws, also in the side housing movable panels to be fastened with screws between panel points.

Drawings of the Chicago & Northwestern Railway standard pile trestle.

The accompanying tables, showing life of piles and life of bridge timber are somewhat abbreviated from the printed report of the committee; we have omitted the last two columns giving the name of the railroad and the authority, this simply to save some space.

The discussion brought out little information not included in the report. Mr. W. W. Fletcher (C. & N. W.) was opposed to painting green timber, as it causes dry rot. He has observed that covered bridges unpainted have lasted 30 years, while the life of painted bridges is about eight years. Mr. W. E. Harwig (L. V.), in answer to a question how early decay of piling in iron ore trestles can be avoided, said the Lehigh Valley had found yellow pine piles treated with creosote best adapted to such places. The creosote treatment doubles the cost of the timber.

### Highway Crossings.

A committee, of which Mr. J. H. Markley was chairman, reports on the best method of constructing and maintaining highway and farm crossings. The committee sent out 20 circulars of inquiry and got three replies, but none of those replying had charge of this class of work. The committee shows drawings of three different kinds of crossings. One of these is a crossing used on the Toledo, Peoria & Western. Here the ordinary cross ties are laid in broken stone. The flangeway is preserved by laying inside the running rails old rails on their sides, the head of this rail fitting under the head of the running rail. This device is, of course, very familiar to the reader. The whole is planked in the usual way. This crossing is for towns of some size, where the team traffic is heavy. For the ordinary country road the cross ties are laid in broken stone eight to 12 inches thick, the flangeway is maintained by putting inside the running rails old 52-lb. steel rails, and the space between these latter is filled flush with broken stone, the planking being used only outside the running rails.

Another plan of crossing is the standard of the Pennsylvania Company. Here the track is laid on broken stone, and between the running rails is a frame of planking spiked to the ties and enclosing broken stone, flush with the top of the rail. To make this frame, oak planks 4 in. x 12 in. are used and the edges are chamfered where wagon wheels come on the crossing.

### Sanitary Arrangements for Small Stations.

A committee, of which Mr. W. A. Rogers is chairman, reports on this subject. Quite a number of replies were received to the circular sent out, and these replies in general contain suggestions of some interest and value.

Extracts from the next report, "The Best Means for Pumping Water at Water Stations," are given in this issue; the report was signed by Messrs. A. Shane, A. S. Markley, R. L. Heflin and W. G. Smith. Mr. J. Stannard (Wabash) said it was the policy of that road to encourage small towns to build waterworks, and wherever this was done the road took water from the local water company. At Moberly, Mo., the contract price was five cents per 1,000 gallons. Wherever the railroad had pumping plants of its own steam pumps were used, with slack coal fuel.

The Chicago & Northwestern has one gasoline pumping plant, lately installed; the price paid by the C. & N. W. to local water companies varied from 5 to 10 cents per 1,000 gallons, the highest price being paid at Chicago. The gasoline plant costs only about 2 cents per 1,000 gallons, including repairs and supplies; the steam plants cost a little more, making the average cost of water at all points during the entire year about 4 cents per 1,000 gallons.

Mr. C. M. Large (Erie & Pittsburg) said by using natural gas for fuel, the cost for pumping water was as low as 1 to 1½ cents per 1,000 gallons.

Mr. W. M. Noon (D. S. S. & A.) said his cheapest station was one where water was pumped by a ram; the head is 10 ft. and water is lifted 60 ft. The apparatus is started by the section foreman, and is sometimes allowed to run continuously for a month at a time. At other points where steam pumps are used, one $40 pumper has charge of three or four small stations, situated from 15 to 20 miles apart, going from one to another on trains. Where gasoline engines are used some man about the station does the pumping without aditional pay. About one-half the small steam pumping plants are run by telegraph operators or section men, who receive $5 a month extra. A local company furnishes water for two stations at $700 a year. Other speakers favored the use of gasoline pumping engines for isolater water stations.

Then followed a brief discussion of the means for preventing fires in railroad buildings. About half the fires in small buildings such as watch boxes, signal towers, etc., start between the ceiling and the roof. For that reason Mr. A. S. Markley has abandoned the use of ceilings, although that cannot be done in station buildings. Cast iron and vitrified smoke jacks are to be preferred to galvanized or black iron. Metal boxes with covers should be placed throughout shops and round-houses for old waste and other inflammable materials; windows should be kept glazed and roofs repaired to prevent the entrance of sparks from passing locomotives. There should be hydrants throughout shop buildings and grounds, and hose should be kept at convenient points for use in cases of fire. Many shops have an organized fire brigade. At stations there should be a small building well isolated for storing oil, lamps and such materials. Fire extinguishers are useless unless they are emptied and cleaned and fresh liquid put in at least once each year. Mr. Pickering said the clothes lockers used by enginemen in round-houses were sources of danger from fire to which little attention was paid. For putting out fires in yards close to the tracks a convenient arrangement was to have hose suitable for the injector fittings; using the injectors of yard engines to throw water. This precaution was now taken by the Boston & Maine, and had been found useful.

The following were selected as subjects for reports at the next meeing: 1. Tools for the equipment of a gang of bridge men. 2. Best snow fence; stationary or portable. 3. Best method of erecting track scales; suspended or under track. 4. Is concrete the most suitable material for bridge piers and abutments, culverts and arches? 5. Hand pneumatic riveters; power used and the actual cost compared with hand work in the field. 6. Best and cheapest bumper for yards and terminals. 7. Are tie plates on bridges a benefit or detriment?

The Committee on subjects also recommended that a history of the Association be prepared by a committee and presented at the next (the tenth) annual meeting. St. Louis was selected as the place of the meeting next year, which will be held October 9 it was at St. Louis that the Association was organized.

The officers elected for the ensuing year were a-

## Life of Piles and Bridge Timber—Committee Report to B. & B. Association.

### Table I.—Life of Piles.

| Kind of timber. | Average life when driven in | | | State. |
|---|---|---|---|---|
| | Salt water. | Fresh water. | Dry land. | |
| Cedar, white | | | Over 20 yrs | Wisconsin. |
| Cedar | | 28 yrs. | 16-20 yrs. | Wisconsin, |
| Cedar | | | 20 yrs. | Wisconsin. |
| Cedar | | 20 yrs. | 20 yrs. | Wyoming. |
| Chestnut | 40 yrs. | 20 yrs. | 15-18 yrs. | Me., N. H., Vt., Mass. |
| Chestnut | 15 yrs. | 15 yrs. | 12 yrs. | Rhode Island. |
| Cypress | | | 7 yrs. | Illinois. |
| Oak | 35-40 yrs. | 8 10 yrs. | About 12 yrs. | Massachusetts. |
| Oak | | 20 yrs. | 14 yrs. | New Hampshire. |
| Oak | 9 yrs. | 9 yrs. | 8 yrs. | Rhode Island. |
| Oak, white | 8 at water line | 10 yrs. | Ohio, Indiana, Ill. | |
| Oak, white | | 15-30 yrs. | 8-12 yrs. | Illinois. |
| Oak, white | | | 8 yrs. | I linois. |
| Oak | | | 5-20 yrs. | S. Dak. and Minn. |
| Oak, white (best quality) | | | 20 yrs. | Wisconsin. |
| Oak, white | | 25 yrs. | 10-14 yrs. | Wisconsin. |
| Oak, white (northern grown) | | 20 yrs. | 15 yrs. | Wisconsin. |
| Oak, white (southern grown) | | 10 yrs. | 8 yrs. | Wisconsin. |
| Oak, white | | 20 yrs. | 12 yrs. | Wyoming. |
| Pine, long leaf yellow | 10 yrs. | 10 yrs. | 10 yrs. | Miss. and La. |
| Pine, Norway | | | 6 yrs. | Wisconsin. |
| Pine, Norway | | 7 yrs. | 6 yrs. | Minnesota. |
| Pine, white | | 8 yrs. | 7 yrs | Minnesota. |
| Pine | | 15 yrs. | 8 yrs. | Wyoming. |
| Spruce | | 10 yrs. | 7-8 yrs. | Me . N. H., Vt., Mass. |
| Spruce | 8-10 yrs. | 4-6 yrs. | 4-6 yrs. | Massachusetts |
| Spruce, red | | 10-15 yrs. | 8-10 yrs | Colorado. |
| Spruce, red | | | 7 yrs. | Colorado. |
| Tamarack | | 18 yrs. | 10-12 yrs. | Me . N. H., Vt., Mass. |
| Tamarack | | | 8 yrs. | Wisconsin. |
| Tamarack | | | 8 yrs. | Minnesota. |

### Table II.—Bridge Timber. Average Life in Years.

| Kind of Timber. | Exposed to weather | | | Protected from Weather. | | | State. |
|---|---|---|---|---|---|---|---|
| | Stringer. | Trestle. | Truss. | Stringer. | Trestle. | Truss | |
| Long Leaf Southern Pine. | 12-14 | 15-20 | 15-20 | Indefinit'y | | Indefinit'y | Me., N. H., Vt., |
| " " | 10-12 | 12-15 | 12-14 | | | | Mass. [Mass, |
| " " | Good for | about 15 | years. | Practic'lly | as lasting | as iron. | New Hampshire. |
| " " | 16 | 18 | 15 | 40 50 | 40-50 | 40-50 | Rhode Island. |
| " " | | 9 | | | | | Alabama. |
| " " | 8 | 8 | | | | | Miss. and La. |
| " " | | | 16-17 | | | 20 | S. Dak., Minn |
| " " | | 8 | | | | | Illinois. |
| " " | 14 | | | | | | Ill., Ind., Ohio. |
| " " | 10 | 10 | 10 | | | | Colorado. [Mass. |
| White Pine | 10-12 | | 14-18 | Indefinit'y | | Indefinit'y | Me., N. H., Vt., |
| " | | | | | | 40 | Massachusetts. |
| " | | | | | | 40 | New Hampshire. |
| " | 10 | 10 | 10-12 | | | | Missouri. |
| " | | | 10 | | | 14 | Ohio, Ind., Ill. |
| " | 10-12 | 2-14 | | | | | Illinois. |
| " | 8-10 | 8-10 | 8-10 | | | 30+ | Wisconsin. |
| " | 10-12 | 13-15 | 16 | | | 20+ | S. Dak., Minn. |
| " | 10 | 10 | | | | | Minnesota. |
| Eastern Pine | 12 | | 12 | | | | Wyoming. |
| Colorado pine | 10 | 8-15 | | | | | Colorado. |
| Norway Pine | 10 | | | | | | Wisconsin. |
| " | | 8 | 8 | | | | Minn. [Mass. |
| Spruce | 6-7 | | 8-10 | 40 | | Indefinit'y | Me., N. H., Vt., |
| " | | 5-7 | | | | | Massachusetts. |
| Oregon fir | 16 | 14 | 10 | | | | Wyoming. |
| " | 18 | | 18-20 | | | | Colorado. |
| Fir | 12 | | | | | | Minnesota. |
| White oak | | 7 8 ties 14-18 | & caps. | | | | Ohio, Ind., Ill. |
| " | 18 | | | | | | Illinois. |
| Red Cypress | 12 | | | | | | Wyoming. |
| | | | | | | | Alabama. |

follows: President, A. S. Markley (C. & E. I.); First Vice-President, W. A. Rogers (C., M. & St. P.); Second Vice-President, J. N. Staten (C. & O.); Third Vice-President, W. S. Danes (Wabash); Fourth Vice-President, B. F. Pickering (B. & M.); Secretary, S. F. Patterson (B. & M.) Concord, N. H.; Treasurer, N. W. Thompson (Pennsylvania Lines West of Pittsburg). Executive Committee: T. M. Strain (Wabash), R. L. Heflin (B. & O.), F. W. Tanner (M. P.), A. Zimmerman (U. P.), H. D. Cleaveland (P., B. & L. E.), and A. Montzheimer (C. & N. W.).

On the third day the plants of the Detroit Bridge & Iron Works and the Detroit Graphite Manufacturing Company were visited.

The following companies had exhibits at the convention:

Asphalt Ready Roofing Company, New York. Samples of various asphalt roofing materials, asphalt paints and roofing papers.

Paul Dickinson, Chicago. Section of full-size watch house showing application of the Dickson adjustable smoke jack. This jack is made of cast iron, and is suitable for roofs of any pitch.

Fairbanks, Morse & Company, Chicago. Complete 4 h. p. gasoline pumping plant in working order. The engine and pump are mounted on the same base, the capacity being 6,000 gallons of water an hour when working against a head of 160 ft. Full-size valve used in the Sheffield automatic stand pipe, with large drawings of the stand pipe. Also, four sizes of "Barrett" track jacks and a Sheffield gasoline motor car for three men, which weighs 250 lbs. and is capable of attaining a speed of from 25 to 30 miles an hour.

A. O. Norton, Boston, Mass. An assortment of Norton ball bearing bridge and track jacks.

Standard Paint Company, New York. Samples of "P. & B." ruberoid roofing, and sheathing and insulating papers.

H. C. Wilson, Birmingham, Mich. Model of the "Detroit" crossing gate operated by levers in a tower.

## The Federal Industrial Commission.

On Oct. 21, President John K. Cowen of the Baltimore & Ohio was before the Industrial Commission. The substance of what he said, as reported by the Associated Press, is as follows: Mr. Cowen is opposed to State laws restricting the running of trains on Sunday. The B. & O. traversed some States having laws prohibiting Sunday traffic, but there had been no prosecutions and no cessation of business on account of the laws. Mr. Cowen said the savings

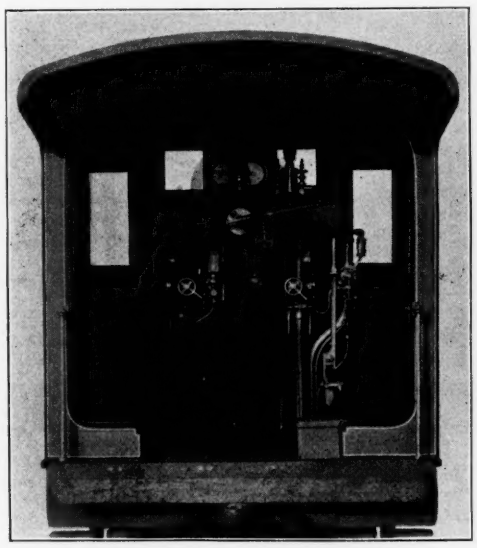


Fig. 2.—Cab of Schenectady Locomotive for Midland Railway of England.

fund of his road was very popular with the employees. He did not believe the arbitration law of the last Congress would have any effect.

The railroads would like to get rid of pass-giving, but the job is too difficult. Public officials were the most frequent beneficiaries under the system, and they were given passes as a matter of courtesy and not as a bribe. Members of Congress generally traveled on passes and prosecuting officers in the various counties along railroad lines generally received free transportation. While he would like to see the pass system supplanted by pay business, the change would not result in lowering rates. The discontinuance of pass-giving would not be possible in the present state of public opinion. A law on the subject would not be effective, therefore it is unnecessary to burden the statutes with it. He had been told by a New York railroad man that the prohibitive law of that State had increased rather than diminished the number of passes used.

He advocated the authorization of pooling contracts as the best means of preventing discriminations. He would be willing to vest the inter-State Commerce Commission with power in a litigated case to say whether a rate were reasonable or not, giving appeal to the courts, but he did not believe that railroad men generally would be willing to make this concession. He thought that Government ownership of railroads would be "sublime folly."

Mr. Stuyvesant Fish, President of the Illinois Central, was before the Commission on the same day. He made an argument for the shipment of freight for export to New Orleans. With equal volume of movement, he said, freight could be carried more cheaply from Chicago to New Orleans than from Chicago to New York. The competition of river transportation is no longer formidable. In three years not a bale of cotton had been carried into New Orleans by boat. He expressed the opinion that wages would always be controlled by the law of supply and demand, "except as its operation may be influenced by labor trusts seeking to prevent freemen from selling their only capital in the best market." But Mr. Fish by "labor trusts" did not refer to the Brotherhood of Locomotive Engineers or the Order of Railroad Conductors, and others of the same kind, but to the professional labor agitators. Mr. Fish advocated the taxation of railroads by taxing their gross receipts, and the abolition of ticket brokerage.

Mr. Fish said there was a commercial necessity for lower rates for exports than for articles intended for domestic consumption, and if not permitted to make this difference the export business could not be held. He did not believe in Government ownership.

## An Inspirator Fixed to the Boiler Head.

In locomotive No. 511, recently built by the Schenectady Locomotive Works for the Boston & Maine, the Hancock inspirator is fixed to the back head of the boiler, as shown in the accompanying engraving. The arrangement was designed by Mr. C. B. Smith, Chief Draughtsman in the Boston & Maine shops. The manner of carrying out the plan, which is sufficiently indicated in the picture, was adopted with a view to making as few changes as possible in the existing arrangement of other fixtures. The other view, Fig. 2, is from a photograph of a locomotive for the Midland Railway of England, recently built at the Schenectady Works. The injectors for these engines were designed especially for the location, as shown.

## Notes on Electric Motors in Railroad Service.*

By Mr. W. B. Potter.

The conditions imposed on electric motors in railroad service are so intermittent and varied that it is not possible to establish a standard factory test that will meet all the requirements of actual practice. The General Electric Company has therefore adopted, as representing extreme conditions, an arbitrary standard, based on temperature rise of the motor of 75° C. in one hour, the temperature of the surrounding air being assumed at 25° C. The horse power rating obtained on this basis represents only one hour's continuous run and the temperature of the motor will rise to an injurious point if it is operated for an extended time at the rated output.

While a railroad motor cannot be operated continuously at the rated horse power without injurious heating, this output can be exceeded for short periods of time, as in rapidly accelerating a car or climbing short heavy grades, but for ordinary service the average horse power required of a motor throughout the day should not be greater than 30 per cent. of its horse power, rated on the hourly basis, which will give a temperature rise of about 60° C.

These figures are based on a line potential of 500 volts, and the average rating of the motor may be increased approximately as the voltage is increased. For example, if a motor wound for 500 volts be operated on a potential of 550 volts, the average output may be increased about 10 per cent.

When electric brakes are proposed, a motor of greater capacity must be used, since the heating of the motor is increased from 20 per cent. to 25 per cent. by the use of electric brakes, this extra heating depending on different conditions of service. The minimum increase of 20 per cent. represents a service containing few grades and stops, and the maximum of 25 per cent should be allowed on hilly roads with frequent stops, where the electric brake will be in use a large part of the time.

### Horse Power of Motors.

The total horse power (rated on the hour basis) of an equipment for ordinary city and interurban service may be determined approximately by the following general formulae. The ton in all cases is taken as 2,000 lbs.

Horse power = (Total wt. in tons) × (Maximum speed in m. p. h. on level) ÷ 5.

If electric brakes are to be used the formula should be as follows:

Horse power = (Total wt. in tons) × (Maximum speed in m. p. h. on level) ÷ 4.

If the maximum speed is not known it can be taken as being twice the schedule speed, since this ratio is usually found in practice.

As an example, assume a 20-ton car with a maximum speed of 50 miles per hour, the line potential being 500 volts, then $20 \times 50 \div 5 = 200$ h. p., or four 50-h. p. motors.

If the line potential be increased to 600 volts, electric brakes could be used with these same motors, the gear ratio being changed to give the same speed as before.

As another example, consider an ordinary street car weighing, equipped and loaded, 11 tons, the maximum speed being about 25 miles, then $11 \times 25 \div 5 = 55$ h. p., or two 30-h. p. motors.

If electric brakes were to be used, then $11 \times 25 \div 4 = 69$ h. p., or two 35-h. p. motors.

The motor capacity required for any given service is so largely affected by the condition of track, grades, etc., that these rules should be cautiously applied, as they are simply a guide to the selection of a motor equipment and indicate the minimum capacity under ordinary conditions.

The schedule speed, or speed of the entire run, including stops, is ordinarily about one-half of the maximum speed on a level track, but where stops are frequent this ratio becomes less. In suburban service this figure may be exceeded since the relation between the two speeds is governed by the number of stops per mile the cars are required to make, and the fewer the number the more nearly the schedule speed will approach the maximum speed. For example, if a certain equipment can make a maximum speed on a level of about 25 miles per hour, then the limit of the schedule speed with seven stops per mile will be about 10 miles to 12 miles per hour, while the same equipment, with but two stops per mile, could make a schedule speed of between 15 miles and 18 miles per hour. High schedule speeds with frequent stops require equipments with large motor capacity and problems of this kind should always be treated as special.

### Tractive Effort.

The tractive effort required to move a car or train is dependent on the rate of acceleration, grade and car friction, air resistance being included in the latter. In railroad practice acceleration is conveniently expressed in miles an hour per second; that is, an accelerating rate of 1 mile an hour per second means that the rate of speed is increasing 1 mile each second and that in 20 seconds, for example, at this rate, the speed will be 20 miles an hour. One mile per hour per second is equivalent to 1.466 ft. per second.

Excluding car friction, a tractive effort of 92⅛ lbs. per ton (2,000 lbs.) will produce an acceleration of 1 mile an hour per second on a level track, and the rate of acceleration will vary in direct proportion to the amount of tractive effort used. On the ordinary street car the tractive effort during acceleration often rises to between 200 lbs. and 300 lbs. per ton. In elevated or suburban train service the maximum tractive effort is generally

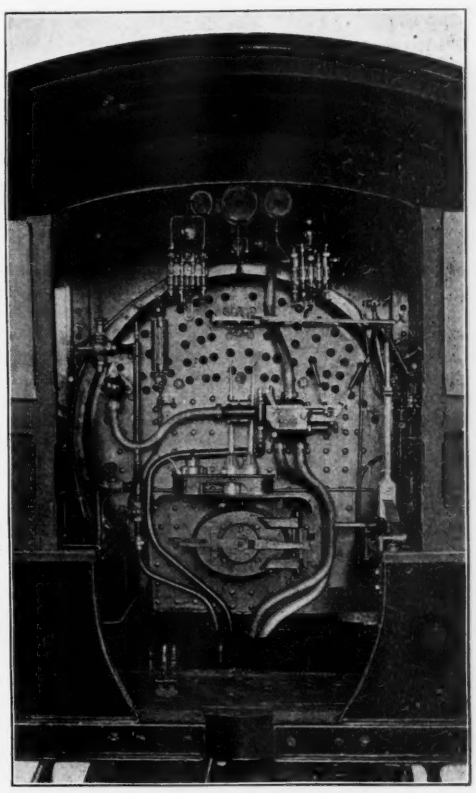


Fig. 1.—Cab of Boston & Maine Engine No. 511

from 100 lbs. to 150 lbs. per ton, while for heavy freight work where slow speeds are used, it may not exceed 30 lbs. or 40 lbs.

Grades are commonly expressed in percentage of feet rise in a length of 100 ft. and the tractive effort required for a grade is the same percentage of the weight as the rise in feet is to a length of 100 ft. For instance, a 3 per cent. grade will require a tractive effort equal to 3 per cent. of one ton, or 60 lbs. per ton. To this figure must be added the tractive effort necessary to overcome the car friction, if the total tractive effort is required.

The car friction necessary to overcome the rolling friction of the rail and air resistance has been compiled from a number of tests and the approximate amounts are given in the following table:

Fifteen-ton car, up to 25 miles per hour, tractive effort equals 25 lbs. per ton.
Fifteen-ton car, up to 50 miles per hour, tractive effort equals 50 lbs. per ton.
Twenty-five ton car, up to 25 miles per hour, tractive effort equals 20 lbs. per ton.
Twenty-five-ton car, up to 50 miles per hour, tractive effort equals 25 lbs. per ton.
One hundred-ton train, up to 25 miles per hour, tractive effort equals 15 lbs. per ton.
Heavy freight train, up to 25 miles per hour, tractive effort equals 6 lbs. to 10 lbs. per ton.
The above figures would be considerably increased by presence of snow or dirt on the track.

### Tractive Coefficient.

This coefficient is usually expressed as the ratio between the weight on the driving wheels and the total tractive effort and is dependent upon the adhesion between wheels and rail. It has a variable value for the same equipment, being largely affected by the condition of the rails, whether wet, dry or sanded.

In train work, it may be stated as a general rule, that the weight on the driving wheels should be at least

*From the October issue of the Street Railway Journal.

six times the tractive effort required. For example, the weight of a locomotive necessary to haul a 100-ton train up a 2 per cent. grade would be found as follows:

100 × 15 lbs. friction = 1,500 lbs. for friction of train.
100 × 40 lbs. for grade = 4,000 lbs. for grade.
Total tractive effort required, 5,500 lbs. for train only.
Assuming a 20-ton locomotive, we have:
20 × 15 lbs. for friction, = 300 lbs.
20 × 40 lbs. for grade, = 800 lbs.
Total tractive effort for locomotive only, 1,100 lbs.
Total tractive effort for train, 5,500 lbs.
Total, 6,600 lbs.

This is 16.5 per cent. of 20 tons, the weight of the locomotive, it being assumed that all axles on the locomotive are equipped with motors and the entire weight is, therefore, available for traction.

Starting this train on the 2 per cent. grade, assuming the slow accelerating rate of one-third of a mile an hour per second, would require an additional tractive effort of 92.3 ÷ 3 = 30.8 lbs. per ton, a total of 11,543 lbs. This would necessitate using a 35-ton locomotive, and the total tractive effort in this case is 16.8 per cent. of the weight of the locomotive, or 35 tons.

The following table is based on the results of a series of tests and shows, in a general way, the variation in the tractive coefficient under different conditions:

| | Per cent. | Sanded, Per cent. |
|---|---|---|
| Dry rail | 28 | 28 |
| Thoroughly wet rail | 20 | 25 |
| Greasy moist rail | 15 | 25 |

With ice or snow on the rails the coefficient may be even lower, while the rolling friction at the same time may be largely increased on account of the snow. With this fact in mind, the value of four-motor equipments, even for single cars, is evident, especially on suburban service where the cars run through an open country exposed to snow and ice.

Average Energy.

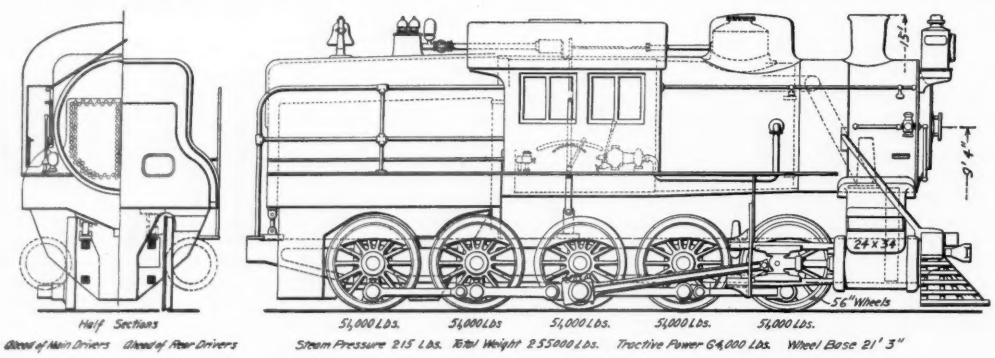
To approximate the capacity of the power station for any given service the average energy required may be assumed as 100 watt hours per ton-mile of schedule speed. As an example, assume a schedule speed of 12 miles per hour and a car weighing 15 tons. The average kilowatt rate of energy consumption per cent. would be 100 watt hrs. × 15 tons × 12 m. p. h. = 18,000 watts = 18 k.w.

The figure of 100 watt hours per ton-mile of schedule speed is generally correct for the ordinary conditions of city and suburban service. If the stops are a mile or more apart, the energy consumption may be as low as 60 watt hours or 70 watt hours, while frequent stops and very high schedule speeds may increase this figure to 120 watt hours or even more.

## Two Locomotive Designs.

In view of the interest now taken in fast passenger and heavy freight locomotives, we publish in this issue the general drawings of two locomotive designs made about a year ago which may prove suggestive, as they are still considerably in advance of present practice, although some passenger engines recently built are almost as large and closely resemble the one shown.

The first of these is a high-speed, simple engine for very heavy, fast passenger service, and is arrange to burn a low grade of fuel on a wide grate. The maker of this design is of the opinion that single expansion is about as good as compound working in such service, and the simple engine is less complicated; but of course some will not agree to this. The general proportions are exceptionally good, and it may be noted that the dimensions are larger than those of any existing passenger locomotive. The Atlantic type was necessarily selected, as under the conditions named it offers more advantages than any other. It is probably a significant fact that the latest heavy passenger locomotives built in England, Germany and this country have a leading truck, four-coupled driving wheels and a pair of trailing wheels, and doubtless in this country at least the limit of size for eight-wheel locomotives has been reached.




A Design for a Heavy Freight Locomotive.

It will be seen that the boiler is of the wide-firebox, Belpaire form, and differs from the usual Belpaire type in that, instead of sloping the water legs inward to bring the mud ring over the frames and between the drivers, the sheets are curved outward and brought to a mud ring over the trailers and entirely outside the frames, after the manner of a Wootten firebox. However, the characteristic advantage of the Belpaire form is retained; that is, in having essentially parallel surfaces for staying. The boiler is calculated to have 2,875 sq. ft. of heating surface, or nearly a thousand square feet more than the boilers of the usual standard passenger engines; the New York Central & Hudson River engine, No. 999, has 1,930 sq. ft.; the Philadelphia & Reading Atlantic City engines, of the 1027 class, have 1,835 sq. ft., and the Pennsylvania Class "L," 1,918 sq. ft. But within the past few months engines have been built for the Chicago, Burlington & Quincy and Chicage & Northwestern with 2,500 sq. ft. of heating surface. In the design shown, 225 sq. ft. of the heating surface is in the firebox.

To use this enormous heating surface, large cylinders are provided 21 in. in diameter by 28 in. stroke, and 84 in. driving wheels are used, so that this engine could make 75 miles an hour with no higher piston speed than that attained by the old time engines with small drivers. The weight on the driving wheels is considerably more than present practice, but 9 x 13 in. journals are considered sufficient, and a great weight is required to utilize the cylinder tractive power of 23,500 lbs.

One or two peculiarities of design may be noted, the first being the placing of the cylinder saddle under the extension front. It was thought desirable to limit the tubes to a length of 15 ft., and with 84 in. driving wheels this brought the front tube sheet a little ahead of the guide yoke. To make room for the guides, therefore, the saddle was put under the extension front, which could be reinforced to safely carry this load. The cylinders are cast separate from the single, central saddle, and the exhaust passages, instead of being curved in one plane, are given a wind and brought out together at the back where an elbow is bolted on and the passage continued in an easy curve to the exhaust nozzle. There is thought to be no reason why the exhaust passages should not be curved in two planes as well as one, and the slight additional length is probably of small moment in any event. A passage is cored through the saddle and closed by a slide so that the sparks can be removed from the front end. The sand box is crescent shaped, surrounding the front portion of the steam dome. The ash pan is arranged so that the parts forward and back of the trailing wheels shoot the ashes into the central hopper, the sheets having sufficient slope so that there may be no danger of ashes lodging over the wheels and burning the grate bars.

The freight locomotive was designed with a somewhat different idea. So many large locomotives have been built lately that it seemed desirable to determine if possible the limit to a practical design, and see what would result. The clearance limits chosen were the customary bridge and tunnel clearances on Eastern roads. A height of 15 ft. to the top of the stack was taken as the vertical limit, and as Pullman cars are 10 ft. 2 in. wide, that dimension was taken as the horizontal limit. The tunnel clearances determined the shape of the cab roof, and from the edge of this roof the sides of the cab were laid off, 10 ft. 2 in. wide. Allowing a proper space for the engineman, and taking off the thickness of the lagging gave a diameter of boiler barrel of 80 in. Of course, the cylinders must be kept inside of 10 ft. 2 in. out to out and after several trials a diameter of 24 in. was settled on as being about the largest that could be used. When the enormous thrust on the piston is considered it will be seen that large bearing surfaces must be provided to prevent heating, and therefore fairly long crank pins are required.

The next step was to adjust the size of the wheels and the length of the stroke. The height to the center of the boiler was fixed by the dome casing being 15 ft. from the rail, and then the mud ring was placed in such a position as to give a proper distance from the grate bars to the bottom row of tubes. The wheel shields of the ash pan were then laid off, and the remaining distance to the rail determined the size of drivers, 56 in. in diameter. Supposing the main rod to clear frogs by 1 in. when the tires were worn down, and making the main pin of such size as to give sufficient bearing, determined the stroke to be 34 in. The grate was made the full width allowed by the clearance, giving 9 ft. 1 in., and as 11 ft. was considered as long a firebox as a man could well cover, the grate area became 100 sq. ft. Placing the crown sheet and laying off the tubes determined their number to be 460 of 2 in. outside diameter. A boiler pressure of 215 lbs. was taken which made the cylinder tractive power 64,000 lbs., and as 51,000 lbs. was considered about as much as could be placed on an axle, five axles were required to give sufficient weight on the drivers to utilize the tractive force. This makes the locomotive a decapod, and gives a wheel base of 21 ft. 3 in.

As before, the cylinders were placed under the extension front, and the tubes were made 15 ft. 6 in. long. The tube heating surface of such a boiler would be 3,700 sq. ft., which together with the firebox heating surface makes a total of 3,950 sq. ft. Such a boiler should make a great deal of steam, but the large cylinders would probably take all it could make when working hard and exerting the full tractive effort.

With the high steam pressures for which these engines were designed, we are disposed to think that piston valves would be highly desirable.

The following table gives the principal dimensions of these two designs:

| Type | Atlantic. | Decapod. |
|---|---|---|
| Gage | 4 ft. 8½ in. | 4 ft 8½ in. |
| Kind of fuel to be used | Low grade soft coal. | Low grade soft coal. |
| Weight on drivers | 101,000 lbs. | 255,000 lbs. |
| " " truck wheels | 35,000 lbs. | ..... |
| " " trailing wheels | 26,000 lbs. | ..... |
| " total | 162,000 lbs. | 255,000 lbs. |
| Wheel base, total. of engine | 26 ft. 6 in. | 21 ft. 3 in. |
| " driving | 7 ft. 3 in. | 21 ft. 3 in |
| " rigid | 14 ft. 9 in. | 21 ft. 3 in. |
| Height. center of boiler above rails | 9 ft. 4 in. | 9 ft. 4 in. |
| Height of stack above rails | 15 ft. 0 in. | 15 ft. 0 in. |
| Heating surface, firebox | 225 sq. ft. | 250 sq. ft. |
| " tubes | 2,650 sq. ft. | 3,700 sq. ft. |
| " total | 2,875 sq. ft. | 3,950 sq. ft. |
| Grate, area | 85.5 sq. ft. | 100 sq. ft. |
| Drivers, diameter | 84 in. | 56 in. |
| Truck wheels, diameter | 36 in. | ..... |
| Trailing " " | 54 in. | ..... |
| Journals, driving axle, size | 9 x 23 in. | 9 x 13 in. |
| " truck " " | 5½ x 10 in. | ..... |
| " trailing " " | 7 x 12 in. | ..... |
| Cylinders, diameter | 21 x 28 in. | 24 x 34 in. |
| Boiler, type | Belpaire wide firebox. | Belpaire wide firebox. |
| " pressure | 200 lbs. | 215 lbs. |




A Design for a Heavy Freight Locomotive.

## American Street Railway Association—Annual Convention.

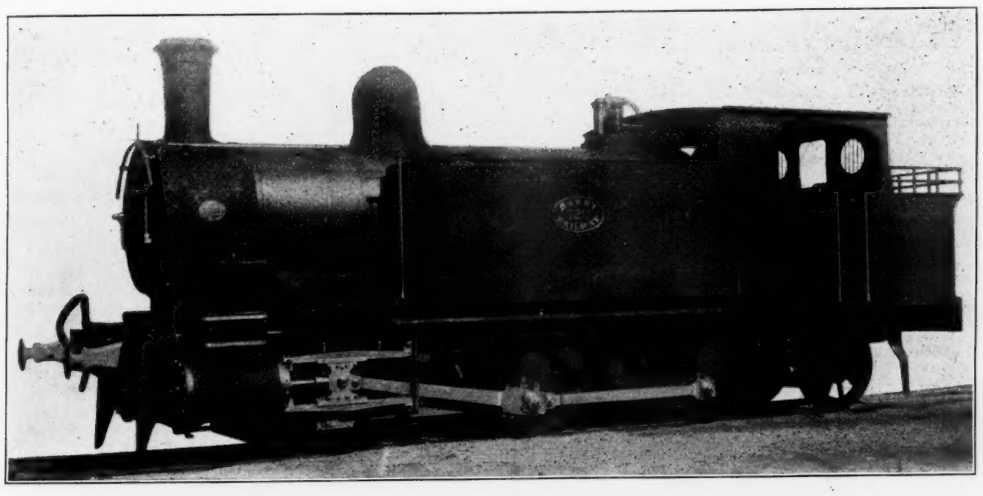
The eighteenth annual convention was called to order by President C. S. Sergeant at Tattersall's, Chicago, on Oct. 17, about 11 a. m. The attendance was larger than at any previous first session of annual meetings. Mr. H. S. Taylor, public prosecutor of Chicago, represented Mayor Harrison and made the address of welcome, which was responded to by President Sergeant, who then delivered his annual address. In this address Mr. Sergeant discussed at length the magnitude of city transportation problems; the financial questions which each year become larger and more similar to those of steam railroads; the labor question; the good will of the communities and the improvement of the service, pointing out in which directions improvement might be considered. Then followed reports of the Executive Committee, which recommended among other things, that any American elevated railroad be made eligible for membership in the Association, and this was adopted. The special committee on carrying U. S. mail on street railroads was continued for another year. The report of the Secretary and Treasurer showed total expenditures to Oct. 11, 1899, $5,648.28, and a balance on hand of $5,658.87. The membership Oct. 11 was given as 172, a net loss of one member since August, 1898. Mr. Charles T. Yerkes' paper on "Investments in Street Railways," was then presented, and discussed at length by Messrs. C. D.

Wyman, of New Orleans; J. I. Beggs, of Milwaukee, H. H. Vreeland, of New York, N. H. Heft, of Bridgeport, Conn., and others. In the evening a reception was given at the Auditorium Hotel.

The second session was called to order at 10 a. m., Wednesday, and a paper by J. H. Vanderveer, Superintendent of Shops of the Brooklyn Heights Railroad Co., on "Care of Car Equipment," was read and discussed. In the afternoon the Association was taken on a trip over the Drainage Canal from 1.30 to 5 p. m., and in the evening there was a very large attendance at Tattersall's to see the exhibits.

The third session was called to order at 10.30 a. m., Thursday, and an invitation to visit the power house of the South Side Elevated was received. A paper by Edward Butts, Chief Engineer of the Metropolitan Street Ry. Co. of Kansas City, was read and discussed. Then followed a paper on "Train Service and Its Practical Application," by Ira A. McCormack, formerly General Superintendent of the Brooklyn Rapid Transit Co., now Managing Director and Vice-President of the Syracuse Rapid Transit Co. The Secretary also read the following report of the Nominating Committee for officers for the ensuing year, which was adopted, and Kansas City, Mo., was selected as the next place of meeting:

President: John M. Roach, General Manager Chicago Union Traction Co., Chicago, Ill.



A Cooke Tank Engine for the Barry Railway., South Wales.

First Vice-President: John A. Riggs, President United Traction Co., Reading, Pa.

Second Vice-President: H. H. Vreeland, President Metropolitan Street Railway Co., New York City.

Third Vice-President: F. G. Jones, Vice-President Memphis Street Railway Co., Memphis, Tenn.

Secretary and Treasurer: T. C. Penington, Treasurer Chicago City Railway Co., Chicago, Ill.

Executive Committee: The President, the Vice-Presidents and C. S. Sergeant, Second-Vice-President Boston Elevated Railway Co.; C. K. Durbin, General Superintendent Denver Consolidated Tramway Co.; Nicholas S. Hill, Jr., General Manager Charleston Consolidated Gas & Electric Co.; Charles W. Wasson, Vice-President Akron, Bedford & Cleveland Railroad Co.; John R. Graham, President Quincy & Boston Street Railway Co.

In the afternoon about 500 members of the Association and ladies visited the packing works of Swift & Co., at the Union Stock Yarks, making the trip by tallyho coaches. In the evening theater parties were given.

On Friday the entire day was given to inspecting the extensive exhibits at Tattersall's, and in the afternoon about 100 attendants at the convention visited the South Side Elevated power house by invitation of the Westinghouse Electric & Mfg. Co., and of the road. At the same time the ladies were taken to drive and to visit the Art Institute and principal stores. On Friday evening the convention closed with the annual banquet, at which the new officers were installed. Mr. C. S. Sergeant acted as toastmaster, and speeches were made by Senator William E. Mason, of Illinois, and a number of others. The weather during the meeting was delightful and the convention was in every way a success.

### Street Railway Accountants Association.

This Association held its third annual meeting at Tattersall's, Chicago, Oct. 17-19. President J. F. Calderwood called the Convention to order Oct. 17, and Commissioner of Public Works McGann welcomed the delegates to the city on behalf of Mayor Harrison. Then followed the address of the President and the report of the Secretary and Treasurer, which showed a total membership of 100, 34 roads having come into the Association since its last meeting. The financial statement showed a deficit and it was unanimously decided to increase the yearly dues from $10 to $20 beginning Jan. 1, 1900.

At the second meeting, Oct. 18, a paper on "Car Mileage," by H. C. Mackay, Comptroller and Auditor of the Milwaukee Electric Railway & Light Co., was read and discussed at length.

At the third day's meeting, Oct. 19, the report of Mr. C. N. Duffy, Chairman of the Committee on "A Standard Classification of Accounts," was presented and discussed. The next meeting will be held in Kansas City, Mo. Resolutions of thanks for courtesies extended to the Convention were passed and the following officers for the ensuing year were elected and installed:

President: C. N. Duffy, Auditor Chicago City Ry. Co.

First Vice-President: W. F. Ham, Auditor Brooklyn Rapid Transit Co.

Second Vice-President: W. G. Ross, Comptroller Montreal St. Ry., Montreal, P. Q.

Third Vice-President: Elmer M. White, Cashier Hartford St. Ry. Co., Hartford, Conn.

Secretary and Treasurer: W. B. Brockway, Secretary and Treasurer Toledo, Bowling Green & Fremont Ry., Toledo, O.

Executive Committee: J. F. Calderwood, Chairman, C. L. Wight and C. K. Durbin.

### Cooke Locomotives for the Barry Railway, South Wales.

The accompanying engraving shows one of five engines just shipped from the Cooke Locomotive & Machine Co., Paterson, N. J., to the Barry Railway Co. of South Wales. These six-coupled tank engines have 80 per cent. of the total weight on the drivers, work at 160 lbs. pressure and have cylinders 18 x 24 in. Each engine has a tank capacity for 1,600 gallons and a coal capacity of 1¾ tons. The dimensions and weights are as follows:

| | |
|---|---|
| Gage | 4 ft. 8½ in. |
| Total weight in working order | 126,000 lbs. |
| " " on drivers | 100,000 lbs. |
| " " on trailing wheels | 26,000 lbs. |
| Total wheel base of engine | 20 ft. 8 in. |
| Driving wheel base | 14 ft. 5 in. |
| Cylinder, diameter | 18 in. |
| " stroke | 24 in. |
| Driving wheels, diameter | Six, 51 in. |
| Rear trailing wheels, diameter | Two, 42 in. |
| Driving axle journal | 8 in. dia. x 8⅞ in. long |
| Rear trailing axle journal | 6¼ in. dia. x 9⅞ in. long |
| Boiler, type | Straight top, crown bar |
| " working pressure | 160 lbs. |
| " diameter first course | 53⅛ in. |
| " firebox length | 72⅞ in. |
| " " width | 40⅛ in. |
| " style of grate | Arranged for stationary bars |
| " tubes, number | 181 |
| " " diameter and length | 2 in. dia. x 11 ft. 2½ in. long |
| " thickness of shell | 7/16 in. |
| " heating surface, tubes | 1,049 sq. ft. |
| " " firebox | 98 sq. ft. |
| " " total | 1,147 sq. ft. |
| " grate surface | 21 sq. ft. |
| Slide valve | Richardson balanced, Allen ports |
| Slide valve, travel | 5½ in. |
| Steam ports | 1½ in. x 17 in. |
| Exhaust " | 3 in. x 17 in. |
| Lap | Line and line inside; ⅞ in. outside lap |
| Exhaust pipe | Low; single nozzle |
| Smokebox | Short |
| " netting | None |
| Center of boiler from rail | 7 ft. 5½ in. |
| Top of stack " " | 13 ft. 0 in. |
| Tank capacity | 1,600 gals. |
| Coal " | 1¾ tons |

Materials: Carbon shell steel, Latrobe tires, Ramsbottom safety valves, Vacuum Oil Co.'s cylinder lubricators, Ashcroft steam gages, Vacuum Brake Co.'s brake equipment, Pickering springs, Allen-Richardson valves, U. S. metallic packing, copper fireboxes, brass tubes, Davies & Metcalf's exhaust steam injectors.

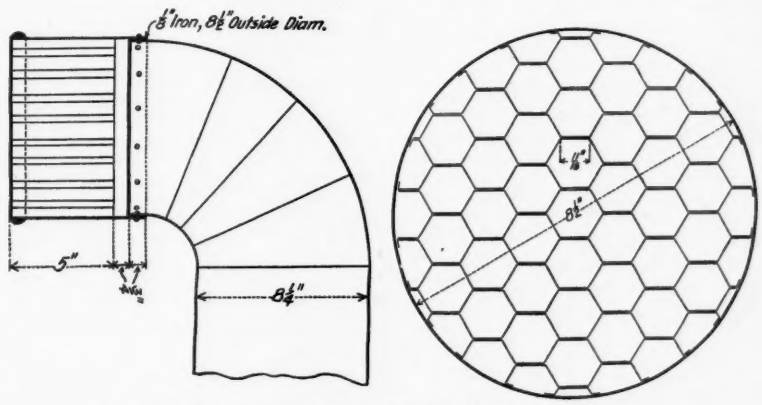
### Spout for Water Cranes.

In order to prevent splashing when locomotives are taking water from stand pipes or water cranes, a canvas hose tied over the nozzle of the spout and hanging down into the manhole of the tender is used generally on the railroads in this country. The canvas wears out quite fast, however, and during freezing weather it is apt to be damaged when the spout is swung back. Some of the railroads are, therefore, instead using a short funnel shaped tube of galvanized iron suspended from a ball secured to the end of the spout, the arrangement resembling a bucket without bottom. If the tenders vary considerably in height, such a device has been found objectionable on account of being non-adjustable in height.

On the Pennsylvania Lines West of Pittsburgh the water stations have been generally equipped with a new arrangement, designed by Mr. Edward Grafstrom, Chief Draftsman at Columbus, Ohio, and a drawings of the device is shown herewith. The cellular extension of the spout breaks up the water stream sufficiently to prevent it from gushing or splashing, and the water shoots in a solid stream straight into the manhole from a distance of several feet above it. The bottom of the cellular extension is placed high enough to clear the highest tenders, and the low ones are not affected by the difference in height.

Quite a number of these devices have been put in use on the road referred to during the last two years, and the only difficulty so far experienced has been at localities where unstrained water is used, when straws or sticks have lodged in the cells, causing the water to spray.

We understand that a similar style of nozzle is successfully used in Germany. The whole arrangement is very simple and effective, and as there is no patent barring its free use, as far as is known, other roads will no doubt be interested in the same.




Mr. E. Grafstrom's Device to Prevent Splashing from Stand Pipes.

### Some Unrecognized Functions of our State Universities.*

The question I shall propound, a d attempt partially to answer, is: What functions in the department of technical science should our State universities be called upon to exercise, in addition to those which they now commonly perform? . . . I will name a few of the most crying demands which, in my opinion, the citizens who support our State universities have a right to call upon the departments of applied science to meet and satisfy.

I. The Education of Teachers of Sanitary Science.

As affecting most nearly and vitally every family I will first name the necessity of providing a sufficient number of high-school teachers of sanitary science. The wonderful revolution wrought by the recent studies in bacteriology in explaining the nature, the spread, and the prevention of disease, has made it incumbent upon all our educational agencies to provide instruction in these most important matters. We should now have a competent teacher of sanitary science in every high-school, and eventually some such instruction should be given in every primary school. No subject yields more readily to school instruction than this, and the interest which could be aroused by a competent teacher in this department would be a revelation to the old-time pedagogue. . . .

II. The Establishment of Courses in Chemical Engineering.

As the second extension of the scope of the work of the technical departments of our State universities, I will name the establishment of courses of study in what may be called Chemical Engineering. Chemistry, like electricity, now enters largely into nearly all manufacturing processes, and the saving of by-products is usually a question of chemical engineering only. It is one thing to perform a chemical experiment in a laboratory, in a small way, where the economy of the operation does not enter at all, and an altogether different thing to devise ways and means by which the same thing can be done continuously, on a large scale, in a factory, at such a cost as to make the operation profitable. The man who can do both of these things is the chemical engineer. There are schools in Germany where industrial chemistry and mechanical engineering are taught to the same students, thus giving them the necessary schooling to enable them to become, by practice, able chemical engineers. . . . Even if both the chemist and the engineer be called in they

*Extracts from an address by Prof. J. B. Johnson, on the occasion of his inauguration as Dean of the College of Mechanics and Engineering, of the University of Wisconsin, Madison, October 14, 1899.

are likely to work at cross-purposes, neither understanding the thought or the purpose of the other. As a matter of fact the chemist must devise his appliances in a large proportion of the problems arising in actual practice, and the highest mechanical ingenuity is often required to effect a solution. In all such cases failure is certain unless the chemist is also an expert mechanical engineer. Whenever these two kinds of ability have been embodied in the same individual, and these coupled with a reasonable amount of executive power, the fortunate possessor has not only attained to wealth and fame, but he has proved a blessing to all the industries with which he has been connected. . . . The department of chemical engineering belongs rather to the engineering school than to that of pure science, and the graduate from this course would be an engineer rather than a chemist. It is in this field of technical education that we are farthest behind Germany. . . .

III. Engineering School Extension Work.

The third field into which I shall hope to see our State universities extend their activities is that of the technical education of young men employed in our manufacturing industries. In another place* I have enlarged upon the necessity of giving to our industrial leaders and workers a much higher scientific and technical education than they now possess. . . . A large proportion of these leaders in our manufacturing industries will always be men who have grown up in the business, from the lowest and most humble positions. Their previous schooling will have been very limited, and the problem we have to face is how to give to these exceptional men of marked abilities a reasonable amount of scientific training in the line of their future employment. In my opinion the problem is already solving itself, as is the case with so many of our unsolved problems in this land of quick initiative and free opportunity. In place of the trade night-schools of Europe we have developed here in the United States, in the course of a very few years, under private initiative and direction, a series of correspondence technical schools, with an enormous patronage.† These schools, though few in number, now carry on their rolls over 100,000 students, these being scattered in all parts of the United States and Canada. Instruction is given wholly by means of special manuals, and by correspondence. Though some of these schools greatly magnify their work, and some are positive frauds, and all their students have, perhaps, too exalted an opinion of their accomplishments, yet they are reaching a class who could not leave their employment to attend other schools, and a good correspondence school can do a great deal for them. No regular technical school has as yet undertaken to do such work by correspondence, and I do not now advocate our entering this field. I should prefer to leave all this work in the hands of the men who have discovered the needs and the methods of satisfying them. . . . The great defect of the correspondence school lies in the entire absence of experimental laboratory work. This the State can very properly supply. By joint action of State and city, these experimental shops and laboratories could be established in every manufacturing center, and if placed under a common State Board they could all be made to work in harmony with the private or the State correspondence technical schools. . . .

IV. Colleges of Commerce.

The fourth new technical department which I should like to see established under every State university is a College of Commerce. By this I mean something very different from the ordinary commercial college of which we have enough and to spare. By college of commerce I mean a college in fact, devoted however to imparting that kind of a technical education most useful to the business man whose dealings reach beyond our national limits. . . . Under the action of the inexorable law of the survival of the fittest, those who are best qualified to do the business in a particular field will get the business to do. All the leading continental countries of Europe have established these high-grade colleges of commerce and their graduates soon come to take responsible positions either in the foreign consular service or in large business establishments. The oldest of these is the one at Antwerp, which is now some forty-five years old, and to which young men come from all parts of the world. So highly is the work of this school held by the Belgian Government that all the foreign consuls and consular agents of that government must be graduates of the Antwerp College of Commerce, or of its equivalent, and while this address was in preparation word comes through the daily press that the German Government is preparing a bill to be passed at the next meeting of the Reichstag which provides that in future all appointees to German consular positions must be graduates of one of these colleges of commerce, of which Germany now has several. . . .

The failure of our higher educational courses to fit men for business careers is recognized, and there is a feeling among business men that the ordinary college education actually unfits a man for business. But here is a kind of college course having a very considerable value in the way of mental training and general culture, which at the same time directly fits a man to enter any large manufacturing or business house having foreign connections either in the purchasing or in the sales department, or to accept at once a subordinate appointment in our foreign consular service. This latter service will in future offer great attractions. Our business interests are now demanding greater fitness in the appointees to these positions, and greater permenancy of tenure, and to these demands our Government will be obliged to yield.

*In a Presidential address before the Society for the Promotion of Engineering Education, Boston Meeting, August, 1888. See Railroad Gazette, August 19, 1898, p. 593.

†See a paper by Prof. Edgar Marburg, before the Society for the Promotion of Engineering Education, at Columbus, O., August, 1899, notes on the discussion of which were given in our issue of Aug. 25, 1899, p. 595.

## Pumping Engines for Water Stations.

The following extracts are taken from a report, on the "Best and Most Economical Plant for Pumping Water at Locomotive Water Stations," which was presented at the Detroit meeting of the Association of Railroad Superintendents of Bridges and Buildings. The Committee was Messrs. A. Shane, A. S. Markley, R. L. Heflin and W. G. Smith.

Average Results of Service Tests of Steam and Gasoline Pumping Plants, Chicago & Eastern Illinois R R.*

| Location of plant | Clinton | Clinton. | Clinton. | Clinton. | Bourbon. | Wellington. |
|---|---|---|---|---|---|---|
| Kind of plant | Steam. | Steam. | Steam. | Otto Gasoline. | Otto Gasoline. | Fairbanks-Morse Gasoline. |
| Size of engine | 6 x 10 in. | 6 x 10 in | 6 x 10 in. | 10 h. p. | 6 h. p. | 3 h. p. |
| Size of pump | 5 x 10 in. | 5 x 10 in. | 5 x 10 in. | 6 x 18 in. | 5 x 15 in. | ..... |
| Size of boiler | 3 x 7 ft. | 3 x 7 ft. | 3 x 7 ft. | ..... | ..... | ..... |
| Length of suction pipe, ft. vertical | 2 | 20 | 20 | 13 | 10 to 25 | 10 to 25 |
| Length of suction pipe, ft. horizontal | 200 | 200 | 200 | 200 | ..... | ..... |
| Length of discharge pipe, ft. vertical | 56 | 56 | 63 | 63 | 40 | 35 |
| Length of discharge pipe, ft. horizontal | 1,000 | 1,000 | 1,030 | 1,000 | 2,600 | 300 |
| Date of trial, 1899 | Mch. 8 to 14. | Mch. 15 to 21 | Mar. 28 to Apr. 3. | Sept. 1 & 4. | May 5. | March 3 to 24 |
| Duration of trial, hours | 38 | 40 | 43 | 7.5 | 6 | 131.6 |
| Kind of coal | Screenings. | Lump coal. | Screened coal. | ..... | ..... | ..... |
| Coal used, pounds | 9,490 | 7,945 | 8,425 | ..... | ..... | ..... |
| Gasoline used, gallons | ..... | ..... | ..... | 4 96 | 2 9 | 55.4 |
| Water pumped, gallons | 360,720 | 32 ,760 | 312,900 | 67,500 | 26,965 | 532,560 |
| Water pumped per hour, gallons | 9,493 | 8 019 | 7.974 | 8.996 | 4,496 | 4.046 |
| Coal used per 1,000 gallons water, pounds | 26 3 | 24.8 | 24.6 | ..... | ..... | ..... |
| Gasoline used per 1,000 gallons of water, gallons | ..... | ..... | ..... | .074 | .108 | .104 |
| Cost of coal or gasoline per 1,000 gals. water, cts. | .775 | 1 114 | .827 | .741 | 1 075 | 1 04 |
| Wages of pumper per 1,000 gals. of water cents. | 2 19 | 2 45 | 2 31 | .961 | 1 193 | 1.088 |
| Total cost per 1,000 gallons of water, cents | 2 965 | 3 574 | 3.137 | 1.701 | 2 271 | 2.128 |

Note: From the averages of the Clinton tests, where .074 gallon of gasoline was used per 1,000 gallons of water pumped, the following results are derived: 1 ton of screenings is equivalent to 5.6 gallons of gasoline; 1 ton of lump coal is equivalent to 6.0 gallons of gasoline; 1 ton of screened coal is equivalent to 6.2 gallons of gasoline.

It seems that but few are in position to give reliable data on the cost of supplying water and some have expressed themselves so strongly in favor of a steam pump only, without giving any reason, as to convince the Committee that they are prejudiced; others give no preference, only submitting the result of their experimental tests. The Committee finds one great obstacle in the way in this particular kind of work that tends to impede progress; that is, a prejudice against any system that tends to supplant labor.

Mr. G. W. Smith (C., M. & St. P.), in reply to our circular, says: "To secure economy we must consider many various and often contrary conditions, and in order that net results may be an economy we sometimes are obliged to adopt what is in itself an extravagance. With the present low cost of machinery and low interest rates, the problem of economy hinges almost entirely on operating expense. This is a composite item, but the element of wages is so large a percentage that at the start the problem is reduced to one of securing a pumping plant that can be operated without incurring the expense of a pumper's wages. Where large and reliable supplies are necessary, the use of gasoline as a fuel seems to promise the desired result. Gasoline engines are adapted to run all sorts of machinery, and the fact that they can continue in operation for hours at a time without personal attention makes them at present the most economical form of power in use. But on the other hand, it will not do to assume that the adoption of gasoline engines should be proposed as a general policy, regardless of conditions, because there are cases where a steam pumping plant representing a considerable investment is in operation and where the conditions are such that the man who attends to the steam pump has other duties which will make his continuous employment necessary, even if he were relieved of the duty of pumping water. In such a case it would be manifestly extravagant to incur the expense of a new pumping plant, because practically no operating expense could be saved."

Regarding the cost of pumping water, various members reported to the Committee, but we have selected only those statements which furnish a direct comparison between the cost of pumping with steam plants and gasoline plants.

Mr. J. P. Snow (Boston & Maine): "Our pumping plant at Barre Plains was originally installed as a steam plant and 15 months ago was changed to gasoline. The steam plant consisted of a "B. & B." Blake pump, 6 in. x 6 in. x 12 in., boiler 30 in. x 70 in. upright. The cost of pumping by this plant, including labor, fuel, oil, etc., was 7½ cents per 1,000 gallons. After running a little over two years, a Fairbanks, Morse & Co., gasoline combined engine and pump was substituted. This has been running 15 months and has worked very satisfactorily. According to a test made a few days ago, we are pumping 24,000 gallons daily with a consumption of 52 gallons of gasoline per month. The cost of repairs have averaged about $1 per month, including the cost of renewing batteries. The steam plant required the services of a regular pumper, which, of course, occasioned the large cost of pumping. The gasoline engine is cared for by the station agent and will run for several hours after being started without further attention. At the present price of gasoline we are delivering water into the tank at less than ¾ cent per 1,000 gallons, not allowing anything for attendance. The following figures will show what this pump is doing: Length of suction 873 ft., suction lift 15 ft., number of elbows in suction 4, size of suction pipe 4 in., discharge pipe 4 in., length of discharge pipe 20 ft., height of top of tank above the pump, 22 ft.

Mr. A. S. Markley (Chicago & Eastern Illinois): This road has replaced the steam pumps at five of its water stations with gasoline pumps, three of them being of the Fairbanks, Morse & Co. type, while two are Otto gasoline engines direct connected to Curtis pumps through pumping jacks. The first three named are all surface pumps, two pumping from artesian wells and one from a reservoir. The Otto engines and Curtis pumps have been used where the suction lift is too great for an ordinary pump, and in both of the cases the pump sets in a pit 14 ft. deep, being connected to the pumping jack by a wooden pitman. One Fairbanks-Morse engine is of three horsepower, and the other two each five horse power. One Otto engine is six horsepower and the other ten. The accompanying table* shows the results of several tests which were made to determine the cost of pumping 1,000 gallons of water at several different stations.

It will be noticed that in the test of the steam pump at Clinton, Ind., three kinds of coal were used with a slightly different result in each case, but showing, however, screenings to be the cheapest. As a general thing, the cost of the gasoline used per 1,000 gallons of water pumped will slightly exceed the cost of coal used in pumping the same amount, but, this really depends on the relative prices of the two fuels, the price of gasoline having varied so much within the last year. However, the comparative cost of labor required to run the two plants ultimately makes the greatest difference in the cost of 1,000 gallons of water, and when this is taken into account, the gasoline pump comes decidedly into favor, requiring, as it does, so little attention. The usual wages for pumpers are $35 a month, and the installing of the Fairbanks, Morse & Co. pumps made it possible to save in labor alone $72.50 a month. The two Otto engines saved in labor $40 a month, making a total saving each month on the five plants of $112.50.

The location of a pumping station depends in great part upon what can be saved in labor. To utilize the company's agents for pumpers, the pumping plant should not be over one-quarter of a mile from the station, and as much nearer as is possible. It is advocated by some manufacturers of gasoline pumps that their machinery may be left running an entire day or night without attention. To do this, however, not only endangers the machinery, but the train service as well. Under conditions at water stations where freight trains must have water the consequences of deranging the train service is beyond conception and a break-down, requiring from seven to fifteen hours to repair, then becomes very serious. No pump should be left running more than from three to five hours without some attention, though even in that time something serious might happen. So far, the cost of maintaining the gasoline pumps has not been found to be appreciably greater than for steam pumps, and the amount of oil used for lubricating purposes is practically the same in each case. No serious mishap has yet occurred in running pumps, due to the station agents not understanding the working of the machinery. When a new agent is put at a station where there is a gasoline pump for him to run, a practical man is sent to instruct him concerning it. A catalogue of all pump parts is also furnished each pumper, so that in case of a break-down, he is able to order the necessary parts by wire.

If coal is to be had cheaply and the amount of water to be pumped is considerable, then undoubtedly the installation and maintenance of a steam plant would be the most economical and give the best satisfaction. If, however, the amount of water consumed daily does not exceed 150,000 to 200,000 gallons, and the price of coal is high, then the installation of a gasoline plant should receive attention. Water can be pumped as cheaply with coal delivered in the pump house at 60 cents per ton as with gasoline at 10 cents per gallon, considering fuel only.

Take as an example the former steam plant at Clinton, Ind., supplying 9,000 gallons of water hourly and situated near the railroad company's tracks. A pump house is built, with coal bins, chutes, etc., and in it is placed a 36 in. x 84 in. single-flue vertical boiler and a low-service duplex pump with 5 in. x 10 in. water cylin-

*The table shown was compiled from three tables given in the report, so as to include only the average results.—Ed.

ders and 6 in. x 10 in. steam cylinders. The pump takes water from a river, 20 ft. below it and 200 ft. away, through a 4-in. suction pipe, and discharges through a 4-in. pipe to a 15 ft. x 24 ft. tank, 56 ft. above and 1,000 ft. distant. Coal screenings from a mine near by are delivered in the coal bins for 30 cents per ton, and the pumper gets a salary of $35 per month, which on a basis of 30 days in a month and 10 hours per day, amounts to 11⅔ cents per hour. Now, if the pump delivers 9,000 gallons of water every hour, the cost per 1,000 gallons for labor is 1.3 cents; add to this the cost of fuel, .775 cent, and 2.07 cents is the cost per 1,000 gallons of water pumped, for fuel and labor. The cost of installation of such a plant complete, without tank, is $2,100. Considering the interest on the money invested to be 6 per cent., and the depreciation of the plant 15 per cent., then 21 per cent., or $441 yearly, has to be added to the cost of labor and fuel to determine the true cost of 1,000 gallons of water. This figured on a basis of 9,000 gallons per hour, 10 hours per day, and 365 days in a year, gives 1.34 cents, which added to 2.07 cents, equals 3.41 cents, or the true cost of 1,000 gallons of water pumped by steam.

Now, consider a gasoline plant as installed at Clinton. A 10-horsepower Otto engine is connected to a 6 in. x 18 in. Curtis pump, which has a suction lift of 13 ft. through a 4-in. pipe from an open well 200 ft. away. The discharge is 63 ft. vertically through a 6-in. pipe into a 15 ft. x 24 ft. tank, situated 1,000 ft. from the pump. Such a plant costs $2,270. The output of the pump is, as the one above, 9,000 gallons per hour, but the wages of the pumper are but $10 per month. With 300 hours in a month this reduces to 3⅓ cents per hour and .37 cent per 1,000 gallons of water. The cost of fuel (gasoline at 10 cents per gallon) is .62 cent, and adding to .37 cent gives .99 cent as the cost per 1,000 gallons of water for labor and fuel. With 6 per cent. interest and 15 per cent. depreciation, a total of 21 per cent., of $2,270, is $476.70, which when reduced to 1,000 gallons and added to .99 cent gives 2.44 cents as the true cost of pumping 1,000 gallons of water by gasoline. The difference results in a yearly saving of $320.62 in favor of the gasoline.

Mr. P. Moriarty (Illinois Central): We have a number of gasoline engines in use on our road, and give the comparative cost at five of these stations:

Dorans—A 6-horsepower, combination engine and pump, 8 in. x 10 in. cylinder, suction lift 12 ft. through 36 ft. of 6 in. pipe. Discharge head, 32 ft. through 82 ft. of 6-in. pipe. Present cost of using gasoline, .8 cent per 1,000 gallons of water; former cost with a steam plant, 4.7 cents. These figures, as well as succeeding ones, include the cost of fuel or gasoline, supplies and wages, but not repairs or depreciation charges.

Four Mile Run—A 4-horsepower, combined gasoline engine and 7 in. x 10 in. pump; suction lift, 6 ft., through 22 ft. of 4-in. pipe; discharge, 42 ft., through 110 ft. of 4-in. pipe. Present cost of using gasoline, $1\frac{5}{16}$ cents per 1,000 gallons; former cost, using steam, $1\frac{7}{16}$ cents per 1,000 gallons.

Galton—A 4-horsepower, gasoline engine and 6 in. x 18 in. Eclipse pump; suction lift, 16 ft. of 4-in. pipe; discharge, 42 ft., through 92 ft. of 3-in. pipe. Cost with gasoline, 1¼ cents per 1,000 gallons; cost with steam, 3¾ cents per 1,000 gallons.

Risk—A 2½-horsepower gasoline engine and 5 in. x 10 in. Eclipse pump; suction lift, 5 ft., through 3-in. pipe; discharge elevation, 30 ft., through 3-in. pipe. Present cost with gasoline, 1⅜ cents per 1,000 gallons; formerly operated with windmill.

Charlotte—A 2½-horsepower gasoline engine and 4 in. x 10 in. Eclipse pump; suction lift through 25 ft. of 2-in. pipe; discharge, 40 ft. through 80 ft. of 2-in. pipe. Present cost, using gasoline, 1⅛ cents per 1,000 gallons; former cost, using a horse for pumping, 6¼ cents per 1,000 gallons.

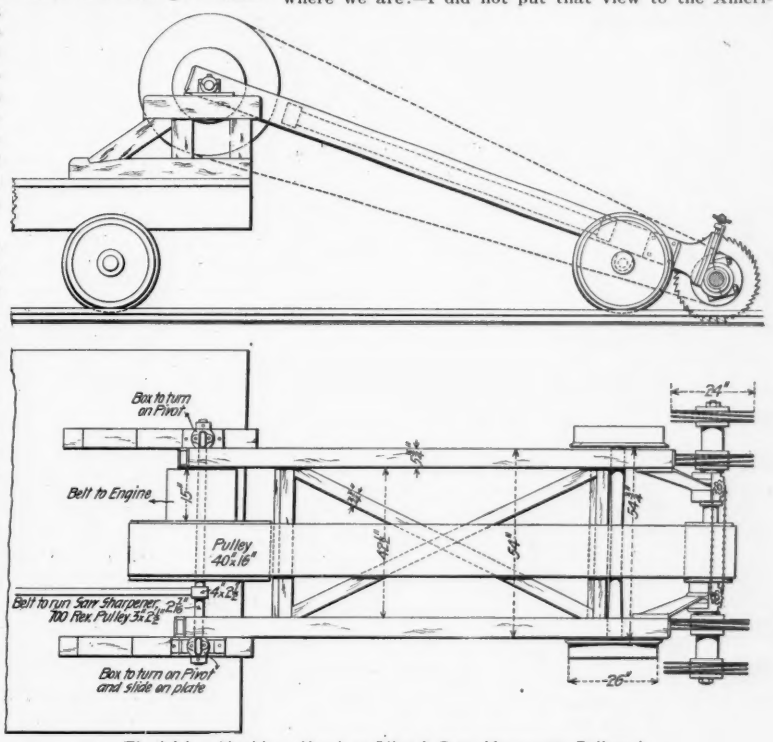
For all of the above plants the gasoline costs 11¾ cents per gallon. With the steam plants we used coal slack, which cost about 25 cents per ton. These gasoline pumping plants are all operated by the station agents or baggagemen in addition to their regular work, and they have no trouble in operating them.

## A New Tie Adzing Machine.

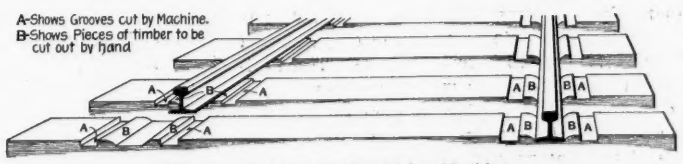
The accompanying engravings show the construction of a new tie adzing machine built by Mr. George M. Brown, Chief Engineer of the Flint & Pere Marquette, and used during the past summer on that road. Its working was also shown to those who attended the Detroit meeting of the Roadmaster's Association.

The apparatus was designed to facilitate re-laying rails and putting on tie plates by cutting a broad groove in the ties on either side and level with the bottom of the rail; by removing the intermediate chip with reference to the gage lines cut by the machine, a smooth, level surface is easily formed for the new rails or tie plates. It will be seen that the grooves are cut by saws mounted on a shaft which is supported at the end of a timber frame, the upper end of the frame being pivoted to the center shaft at the rear of a flat car, while the lower end of the frame is carried by a pair of 26-in. wheels running on the rails. The counter shaft is so belted to the saw arbor, and to a 12 x 20 in. stationary engine mounted on the car, that the saws make 1,500 revolutions a minute. The steam for the stationary engine is supplied from the boiler of a locomotive which pushes the car at a speed of about three miles an hour when sawing hard-wood ties, and when soft-wood ties are run through the speed is increaosed.

Mr. Brown, to whom we are indebted for the drawings, states that this apparatus has given very good results, enabling more and better work to be done with a given number of men than is possible when working in the usual manner.


Box to turn on Pivot
Belt to Engine
Pulley 40x16"
Belt to run Saw Sharpener, 700 Rev. Pulley 3x2½"
Box to turn on Pivot and slide on plate
24"
26"

Tie Adzing Machine. Used on Flint & Pere Marquette Railroad.




Grooves Made by the Tie Adzing Machine.

## Some Improvements on the Denver & Rio Grande.

(From the latest Annual Report.)

The increase in maintenance of way, $102,460.04, was due to the use of about 3,400 tons more new rails than in the preceding year, and to expenditures on account of widening the gage of 34 miles of track east of Alamosa. During the year 10,000 tons of new 85-lb. steel rails were laid on the standard gage main line and 1,200 tons of new 45-lb. on the San Luis branch, a part of the narrow gage system, where old 30-lb. rail was in use. The amount of new rail used, 11,200 tons, was above the average annual requirement, but it was thought best to purchase and lay new 85-lb. rails on the standard gage main line in sufficient quantity to release enough second-hand rails of lighter weight for standard gaging between La Veta and Alamosa.

Six locomotives of the type described in the annual report of June 30, 1897, were purchased, and ten others heavier and more powerful were also built for the company under its specifications; the entire cost of the 16, $177,589.75, was charged against income. During the year six narrow gage engines were taken to pieces; two standard gage switching engines were changed into narrow gage freight engines, and two light locomotives were sold, one standard and the other narrow gage.

Your directors concluded that it was wise to extend the standard gage system from La Veta station across the Sangre de Christo range to Alamosa, which is a central point in the San Luis Valley. The narrow gage line crosses this range of mountains with a maximum grade of 4.7 per cent., or 248 ft. to the mile, and with extremely sharp curves, making train operations very expensive and difficult. By using a pass eight miles south of and 138 ft. lower than the one occupied by the narrow gage line a satisfactory route for a standard gage track was secured, with a maximum grade of 3 per cent. westbound and 2½ per cent. (for a short distance only) east-bound, in which direction the tonnage is the greater. The route adopted permits the use, by widening its gage, of 34 miles of narrow gage road east from Alamosa, which with 27 miles of new construction over the pass referred to affords an extension of the standard gage from La Veta to Alamosa, less than one mile longer than the existing narrow gage. The amount expended upon this work at the close of the year was $275,160.28, which was charged against the Renewal Fund. The new line will be completed and open for traffic in the latter part of September.

## An English Opinion on American Freight Couplings.

The following is a short abstract from the examination of Mr. T. O. Mein by Mr. Acworth in the hearing before the Royal Commission on Accidents to Railway Servants. Mr. Mein, who is Assistant Works Manager of the Great Eastern Railway, visited this country a little time ago to make a special investigation into our methods, and of course he was an important witness in the inquiry made by the Commission:

Do you say that the United States have made a mistake in adopting their automatic coupler?—No, because they had such a bad system before.

Do you suggest that they would have done better to adopt our Gedge coupling with the three loose links?—They had no side buffers which would enable them to have done so.

Do you suggest that if they could have done so it would have been an advantage to them?—I want to understand what your position is?—Yes. I should say that it would have been as great, if not a greater, advance upon the old form of coupling than the one that they have adopted.

You think on the whole, if it had been within the region of practical politics, it would have been a wise thing to adopt the English system?—I do.

And you have talked this matter over, I have no doubt, with a great many American railway officials?—Yes.

Did you find one of them who suggested that, as a conceivable view?—I talked with the American railway officials as to the system of coupling that was in vogue in this country, and they expressed the view that there was no case with us for automatic coupling.

I do not the least want to raise that point at this moment. I asked you the other question, what was thought about it in America, because I want to be clear where we are?—I did not put that view to the Americans, because it would have been based too much on supposition. It would have been assuming that they had side buffers.

You admit they cast about pretty widely for new ideas?—Yes, they are enterprising.

There was not anyone whom you came across who suggested that as a thing they would have liked to have done?—No, the question was not raised.

Would you agree with me that the Americans are satisfied that they have done the right thing on the whole, in spite of the admitted disadvantages and shortcomings of the existing couplers?—Undoubtedly.

You admit they have?—Yes.

## Foreign Railroad Notes.

The International Sleeping Car Co. is to exhibit at the Paris World's Fair next year the special train which it is to provide to run between Moscow and Pekin over the Siberian Railroad when it is finished two years later. This train is to be enclosed by a circular moving panorama, representing the most striking scenes on the long route. The visitor to the train can take his seat in the dining-car, and while he enjoys his lunch, this panorama will pass before him. This, doubtless, will be quite as comfortable as a journey over the railroad.

The Great Eastern Railway of England and the London, Brighton & South Coast have notified those of their employees who belong to the Army Reserve and who have been called to duty in South Africa that their places will be kept open and that half pay will be allowed them during their service for the Government. The London & South-Western has issued a similar notice, but the half pay is allowed only to married men.

The British Board of Trade has presented its annual report on the subject of the hours of labor of railroad employees. In compliance with the law of 1893 this matter is reported on annually in August. During the past year 46 complaints have been investigated, all of them concerning excessive hours of labor. Thirteen of the cases concern signalmen and 11 locomotive enginemen. The number of cases in the last preceding year was 50. The total number of cases in the last six years is 497 and there has been a constant decrease. The Board of Trade took up, on its own motion, the question of the hours of flagmen and watchmen in tunnels, and has made good progress in securing the reduction of the hours of such men, throughout the Kingdom, to eight daily.

RAILROAD GAZETTE

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## EDITORIAL ANNOUNCEMENTS.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to improvements. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The Chronicle's compilation of August earnings shows a gain in gross of 12⅝ million dollars, and in net a gain of five millians. In ratio the gain in gross is 16.69 per cent., and in net 19.44 per cent. The analysis by groups shows that there was a gain both in gross and net in every group, the gain in net having been exceptionally heavy in the Southwest, due very largely to the showing of the Atchison.

The orders for new cars, engines and rails reported in this issue of the Railroad Gazette aggregate an enormous sum of money, and the record is a phenomenal one. The number of cars ordered from the American Car & Foundry Company alone, 21,100, nearly equals the totals (all companies) reported for the two months of August and September. These cars are all to be delivered by May next, and the same is true of the 12,000 cars, heretofore noted, which are to be built by the Pressed Steel Car Company. From statements like these some idea can be gained of the present remarkable activity of the car-building industry. The New York Central's order for locomotives, with its 9,500 cars, represents probably six or eight million dollars to be spent for rolling stock by that company alone. The Pennsylvania's order for rails, at a price said to be 70 per cent. or more above that which was paid for rails which are now being laid, indicates that the experienced men at the head of that company have little expectation of any material reduction in iron and steel prices within the next 12 months. The view of the New York Central people must be substantially the same, as the metal which will be put into their cars and engines will, of course, cost many thousands more than it would have cost a few months ago.

Railroad officers in the West are moving (as they have moved every October for several years) to do away with passes and all kinds of free transportation. The same day the newspapers, reporting the testimony of railroad presidents before the Industrial Commission at Washington, tell how deep-seated the pass nuisance is. The movement ought, of course, to have the good will and help of all good citizens whether they are railroad men or not. There is every argument for it. It is in the interest of public morals and of fair play in politics and in business. It is in the interest of the mass of the passengers and of the shippers and it is in the interest of the railroads. There is no argument against it but the powerful practical argument that it probably cannot be carried out. To do away with passes requires more than the good intention and co-operation of the railroads; it requires, besides these, a correct and wide awake public opinion. The pass is a powerful aid to the railroad in getting the good will of men of influence in public and private life, and it is useful in turning business. Is it supposable that one railroad company will put this weapon out of its hands while its rival still holds it? Is it supposable that agreements not to give passes can be kept any better than agreements not to cut rates? That would be to assume that all railroad officers are more resolute and more scrupulous than a like number of lawyers or merchants or doctors or editors. We must wait, then, until we have the agreement and co-operation of the railroads, plus the co-operation of an enlightened public opinion expressed in effective laws. So long as the law-makers of great States pretend to try to abolish passes by law, and at the same time try by law to get passes for themselves, and so long as the public stands that sort of thing, we cannot say that public opinion on this matter is very enlightened or likely to have much weight.

A despatch from Austin, Tex., says: "P. O. Saunders, living in the City of Mexico, is expected here in a day or two to consult with ex-Governor Hogg relative to the immediate beginning of work on the Intercontinental Railway. The proposed road is to have a capitalization of $25,000,000, and is to be constructed from Matamoras, on the Rio Grande border, along the Gulf coast to Guatemala, thence along the border and down through the South American states to the Pacific Slope, thence along the coast, making a line of 5,000 miles through from North to South America. Mr. Saunders is confident that the plan is feasible. After his consultation with Mr. Hogg both men will probably go to New York to make all financial agreements for the beginning of the work at a very early date."

This dispatch is going the round of the daily press. No one who is informed as to the circumstances will take it seriously; but for the information of those who are not informed it may be well to say that the story is nonsense. We have repeatedly pointed out the reasons for thinking that the Intercontinental Railway is a fantastic dream, and it is not worth while now to go again over the ground. In writing last March of the results of the Intercontinental Railway Commission, we said: "The grand summation of the whole matter is that to complete an all-rail route from New York to Buenos Ayres there must be built 5,456.13 miles of railroad, and that this will cost for grading, masonry and bridges $175,000,000. The reader can supply his own figures for rails, water stations, telegraph lines, station buildings, shops and equipment. We have never taken the Intercontinental Railroad seriously. Its enormous cost is only one of the objections to it. To build a railroad many thousand miles long, which shall not merely be parallel with ocean highways, but actually much longer from port to port than the ocean routes, and to build much of that railroad through a country of great difficulty and of poor and sparse population, has always seemed a fantastic project. The record of these surveys only confirms that notion. The surveys themselves served some useful purpose. They add to the sum of available knowledge and they gave a number of men a chance to display skill, endurance and fortitude; but they confirm the belief that the Intercontinental Railroad is a more chimerical scheme than even Mr. Cecil Rhodes' Cape-to-Cairo Railroad." The twenty-five-million-dollar scheme of Mr. Saunders and Gov. Hogg seems a trifle inadequate in the face of the findings of the Commission.

The two sleeping car companies which, together, control nearly all the sleeping-car business of the country, are consolidated, or will be as soon as the necessary changes can be carried out. (The principal independent lines are the Chicago, Milwaukee & St. Paul, the Great Northern and the New York-Boston.*) The motives of the respective parties of capitalists are not reported, but it seems safe to say that they are *not* connected with any scheme to help the New York Central improve its chances of controlling railroads in New England. An important element in the economical management of the sleeping car business is the pooling of cars, so-called; the use of cars in the Florida or California traffic in the winter and the transfer of the same cars to northern resorts in the summer; and it is conceivable that for this purpose the consolidation will be an advantage to both companies. The Pullman lines to winter resorts will have more cars at their command and the Wagner lines will have a larger supply to draw upon in the summer. This and the obvious economies of a consolidated management afford a sufficient explanation of the motives for the union of the two companies.

*According to the list in the Official Guide, 10 railroads run their own sleeping cars, to wit.: 1, Central of Georgia; 2, Chicago, Milwaukee & St. Paul; 3, Detroit & Mackinac; 4, Flint & Pere Marquette; 5, Georgia; 6, Great Northern; 7, Minneapolis, St. Paul & Sault Ste. Marie; 8, New York, New Haven & Hartford; 9, Peoria, Decatur & Evansville; 10, St. Louis, Peoria & Northern. On each of the first two named the sleeping car business constitutes a large and important department. The New Haven road operates the lines between New York and Boston, including that over the Boston & Albany; but the New Haven runs Pullman sleeping and parlor cars on its two Washington trains and on the boat trains between Boston and Fall River. No. 7 is controlled by the Canadian Pacific, which, as is well known, runs its own sleeping cars throughout its lines in Canada. Numbers 1, 5 and 9 run some Pullman cars.

It can hardly be said that there is likely to be any important change in the relations of the sleeping-car companies to the public or to railroad companies. Between New York and Chicago, St. Paul and Omaha—that is to say, in the territory traversed by Vanderbilt railroads—there has appeared to be sharp competition, in facilities, between the two companies, but there has been no competition in prices and each company has furnished just as good cars, with equally satisfactory service, on other lines where competition was supposed to have no influence. The Wagner Company has been a bidder for the contract of supplying sleeping-car service on some important roads within the past few years (when the Pullman contract expired), and in some cases it has thus enabled the railroad to secure more favorable terms; but we do not learn that any widespread modification of prices has resulted from this form of competition. Speaking generally, the Wagner Company has been a Vanderbilt line and has been extended as the Vanderbilts enlarged their control of railroads; while the Pullman Company has gone everywhere. The Pullman policy appears always to have been to accommodate the facilities and methods to what each road wanted, and as a result the contracts are of many kinds. The ownership of cars, style of fittings or decoration, basis of payment and any and all conditions have been changed whenever changes seemed necessary to promote a satisfactory understanding.

The termination of the existence of the Wagner Palace Car Company as a separate organization will end an interesting chapter in American railroad history. Webster Wagner, station agent at Palatine Bridge for 15 years, was a true pioneer. His enterprise became really a part of the Vanderbilt railroad system, and has expanded with it. Both of the sleeping-car companies have afforded peculiar exemplifications of the energy of the business man and the taste of the architect. In the combined work of the two the architect has often appeared to poor advantage, though in late years the best cars of both companies have been real educators in taste. The consolidated company undoubtedly has before it a great career. Some theorists seem to think that the public, after studying state ownership for a while longer, will compel the railroads to themselves run sleeping cars, so as to save a middleman's profit; but unless the consolidation of railroad lines goes farther than the oldest heads can now foresee, there will always be a field for the independent sleeping car company.

### The Limits of the Size of a Locomotive.

Attention is called to the design of a heavy freight locomotive, made to meet the extreme clearance limits of Eastern roads, the idea being to make as large an engine as possible within a vertical clearance of 15 ft. and a horizontal clearance of 10 ft. 2 in. This is shown to result in a locomotive with five driving axles if the weight per axle is not made excessive and the power of the largest cylinders is utilized. We will not attempt to say whether a larger locomotive could be designed without making radical departures from existing practice, but probably the one shown is very near the limit. It is doubtless a fact that locomotives of the consolidation and twelve-wheel types cannot be made much heavier than some built during the past year, and that the possibilities of these types are nearly, if not quite reached. It then becomes interesting to consider whether there will be a sufficient demand for still larger locomotives to bring about the general building of engines with more than four driving axles. If much larger locomotives are required more driving axles will be needed.

There have been a few decapod engines running in this country for several years, notably those of the Burlington & Missouri River, and the St. Clair Tunnel engines of the Grand Trunk, but the type has not been much used. Still for such service as helping on grades, where most of the big locomotives are used, it is questionable whether the leading truck is really of much use and could not well be dispensed with. For road engines that are expected to run at moderate speeds some form of truck is probably necessary. It follows that if five driving axles can be used in place of four either the weight per axle becomes less for a given tractive weight, which may be of much importance where the track is light, or, if the track is suitable for maximum axle loads, a greater tractive weight is made available.

European engineers have already had to consider

this question, and as a result some engines have been built for the Belgian State Railroads having six driving axles, that weigh in working order 238,000 lbs. These axles are arranged in groups of three each, the rear group driven by two high-pressure cylinders, are fixed rigidly in the frames, while the forward group supports a truck which carries the low-pressure cylinders. These engines were described in our issue of November 25 last and show a design that might be followed if it should ever become necessary to greatly depart from present types in order to get greater tractive power. However, the substitution of a pair of driving wheels for the truck of consolidation and twelve-wheel pushing engines would not be an important change and could be made to result in a more powerful locomotive.

### Some Notes of Experience with Rails.

In 1896 the Northern Pacific Railway Company bought about 103 tons of basic open-hearth steel rails. These were rolled by the Carnegie Company to the 66-lb. section of the Northern Pacific. The only object of the company in trying open-hearth rails was to be able to get very low phosphorous, which, it will be observed, is as small as 0.03 per cent. These rails were laid on a mountain grade near Helena. A runaway engine damaged a number of them so much that they were taken out of the track, but the remainder have been tried in 10 degree curves adjacent to low carbon rails in the same track. The analyses of these rails, both the open hearth and the low carbon, are as below:

| | Open Hearth. | Low Carbon. |
|---|---|---|
| Carbon | 0.65 to 0.75 | 0.35 |
| Silicon | 0.10 to 0.16 | 0.72 |
| Phosphorous | 0.03 | 0.109 |
| Sulphur | 0.05 | 0.077 |
| Manganese | 0.65 | 1.04 |

After a year's service these rails were taken up and weighed to determine the loss. In the high carbon steel (open hearth) the loss in weight was from eight to 10 lbs. per rail. In the low carbon rails it was from 19 to 20 lbs. As a result of this, and of other observations more or less similar in character, Mr. McHenry concludes that there is no reasonable doubt that the high carbon greatly reduces the loss of weight. No reweighing has been made since the first one, the result of which is given above, but that will probably be done now very shortly.

The company is now using a 72-lb. rail, the chemical specifications of which are as below:

| | |
|---|---|
| Carbon | From 0.50% to 0.60% |
| Phosphorous | Not to exceed 0.08% |
| Silicon | Not below 0.10% |
| Manganese | Not to exceed 1.00% |
| Sulphur | Not to exceed 0.05% |

The old 56-lb. section in the main line of the Northern Pacific, which was laid between 1880 and 1883, developed extraordinary wearing qualities. Mr. McHenry had analyses made of rails supplied by the Buffalo Iron Company in 1882 with the following result:

| | Sample 3. | Sample 4. |
|---|---|---|
| Silicon | 0.084% | 0.084% |
| Sulphur | 0.100% | 0.112% |
| Phosphorous | 0.108% | 0.109% |
| Manganese | 1.03% | 1.00% |
| Carbon | 0.48% | 0.50% |

It will be seen that these old rails are higher in carbon than the rail the wear of which is compared above with that of the open-hearth rail, but lower in carbon than the company's standard specifications. It is also lower in silicon and higher in sulphur and in phosphorous, yet it is believed that the percentage of broken rails in the track laid with these old 56-lb. rails compares very favorably with track laid with modern rails, notwithstanding the very severe climatic conditions. These experiences tend to confirm Mr. McHenry in the belief, which is shared by a great many other good engineers, that while the chemical composition is very important, yet differences in heats and in the method of working has more to do with the quality of the finished product than the chemistry. He thinks, further, that if the railroad companies can pay something more than the lowest market price in order to get improved quality they will get more satisfactory results than they would get by increasing the weight of the section.

We have before alluded to the recent dissatisfaction with the results got from heavy sections, and the facts and opinions which we give here are presented as a contribution to the discussion of that matter. Incidentally, the experiment with the open-hearth steel is of great interest. As matters now are there is no chance to make open-hearth rails in this country; the product of the open-hearth furnaces is too valuable for other uses; but it is likely that in some time not very far distant, when the present extraordinary demand shuts down, the new open-hearth plants in the South will be turned to making rails.

### Locomotive Building in Great Britain.

The Engineer (London), of Oct. 13, has a long article summing up its recent discussion of the reasons why American locomotive builders have been able to take part of the market of the British builders, invading even the British Islands. The writer starts out with the proposition that it is quite clear that the United States are competent to compete with the United Kingdom in every market in the world—that it is well to recognize this fact and to seek the reasons.

In the special matter of locomotives there are particular reasons why the capacity of the British shops should be somewhat limited as compared with the shops of the United States. Comparatively few orders for engines for the British railroads are placed in the contracting shops. These are mostly built by the railroad companies themselves. The great volume of business of the contracting builders is for export trade, and here comes in the great source of "The Engineer's" complaint. "To all intents and purposes the trade is largely controlled by men who are not mechanical engineers and who know nothing and care less about trade." In other words, this writer asserts that the locomotive orders are placed by "Great George Street," and to him Great George Street means civil engineers and Great George Street is singularly hidebound and ignorant in mechanical matters.

The inference from this particular article as developed is that the gentlemen responsible for the designs and specifications for locomotives to be exported do not cause these designs to be prepared in such a way as to facilitate work in the shop, but do lay down very severe specifications and do insist upon inspection of an arbitrary and quite unnecessary character. Concerning all this it is not for us to attempt to pass judgment. We shall have to leave Great George Street to settle it with "The Engineer," but some of the builders in "the States" have recently had experience with inspectors sent out by Great George Street, as well as with inspectors sent over by the railroad companies. We have not yet learned which kind of inspectors our locomotive builders find most docile and intelligent, but we judge that they have not seen enough specimens to justify them in generalizing yet. We judge, however, that they have found the inspection pretty stiff. The argument of the British writer is that the inspector rejects what in common sense ought not to be rejected and thus adds to the cost of building engines and greatly increases the time taken to build them.

Another proposition is that the American engine builder takes great pains to get this foreign trade by sending out well-equipped salesmen, facilitating in every way the work of the engineer who draws the specifications, and then "he blazons it forth that he builds engines for every country under the sun. With us locomotive builders observe the utmost secrecy. They will scarcely permit their right hands to know what their left hands are doing." But this, it appears, is not all native modesty. Here again Great George Street comes in with traditions of business secrecy and will not permit the British builder to advertise himself as having built engines for India, we will say, or for Brazil.

But after all, what is the use of making this fuss? We are told that the locomotive engine shops of Great Britain are overcrowded with work, that their prices are high, that they are in a state of almost vulgar prosperity, and that they are greatly increasing their shop capacity. So why should we worry ourselves in seeking the reasons why a few locomotive orders have gone to other countries? The answer to this is that "the real danger is that we shall refuse to learn. If Americans can build locomotives which will do the world's work sufficiently well, by the hundred, while Great Britain is turning out only by the dozen models of mechanical perfection intended to be of use to our grandchildren, we must rest content to stand on one side and let our rivals go ahead. American engineers do not build for posterity; they think of the present and leave the future to provide for itself; and the enormous success of their country is largely due to the concentration and grip which is a necessary concomitant of this policy."

A grain shipper who appeared before the State Commerce Commission said that the special inducements which led his firm to export by way of Boston, Newport News and Norfolk "were not made in a season when there was a glut of grain shipments through New York; just the opposite was the case." We may infer from this that the special rates were offered when there was some struggle for business; but this brings us back again to the question why the roads leading to other ports are in a better shape than those coming here to make a fight for business when there is not quite enough to go around. The roads that come to this port have been allowed to make such terms as they had to in order to get business from the canal, and in comparison with their rail rivals they do not seem to be in a position to fight for their own interests—which are the interests of this port—while the rival roads are always in a condition to fight for the interests of their terminal ports.—Journal of Commerce (N. Y.)

We guess it is very much like the boy who had to put forth such strenuous efforts to capture the woodchuck. "Do you think you'll get him?" asked the onlooker; "I've got to get him," said the boy; "we're out of meat." When business is light some of the roads leading to what the Journal of Commerce calls the "outports" find that the shrinkage in receipts is a much larger percentage of the total income than is the case with the lines leading to New York. In the one case it is a question of getting the grain or laying up a large percentage of the cars and engines; in the other case only a small percentage of the equipment will become idle if the business is not secured. In either case the traffic manager is rather doubtful as to whether any profit will result, and the traffic manager who has the best income from other sources will be the most likely to let the doubt deter him from taking the low-price grain contract. As to making low rates to get grain away from the canal, the Journal should take notice that that competition is at Buffalo, while the competition for Newport News and probably Baltimore and Boston is at Chicago and other Western points. Competition for lake grain, in which the canal boats take a hand, cannot be lumped in with the all-rail competition, as there is a different set of competitors, actuated by different considerations.

Up to this time there has been practically no available data of any consequence on the relative cost of running locomotive water stations by steam and by gasoline pumping engines. In a general way it has been known that gasoline engines are especially suited for isolated stations; but the tests and results of operation that have been published have been such as to form a very unsatisfactory basis for estimating the relative economy of the two kinds of plants in cases where the conditions were not especially favorable to either. For this reason the report on pumping plants for water stations read at the Detroit meeting of the Association of Railroad Superintendents of Bridges and Buildings, and published this week, has particular value. While the whole report is well worth reading, Mr. A. S. Markley, a member of the Committee, has put the answer to the whole question of comparative economy in concise form: The first cost of a steam or a gasoline pumping plant of the usual size, not exceeding a daily capacity of 200,000 gallons of water, is the same. The cost of repairs and supplies can also be taken as equal, while water can be pumped as cheaply with coal delivered in the pump house at 60 cents a ton as with gasoline at 10 cents a gallon. Unless the prices vary considerably from this proportion, the saving through the use of gasoline engines is simply the reduction which can be made in the cost of attendance; something easily determined in any particular case.

It would appear that the movement of freight on some of the most crowded railroads has about reached its maximum for the present. The reporters who have been so long talking about a "car famine" are now telling about crowded elevators, and cars waiting to be unloaded. The need is not for more cars, but more facilities for getting the freight out of the cars. At Boston it is said that a thousand cars of export grain are waiting to be unloaded. At Jersey City the congestion of cars destined for New England (to be transferred across the harbor by float) has been unusual, over 1,000 cars having been waiting at one time. Consignees in New York complain that important shipments of freight are six days behind time in getting in. The Southern Railway and the Louisville & Nashville have ordered their agents to send no cars north of the Ohio River. Shippers at Milwaukee complain that they can send no grain to Buffalo because the elevators there are full. At New York it is said that the advance in rates for carrying grain to Europe, reported a week ago, is to be short-lived. In fact, by reason of the scarcity of freight cars, or a change in the market, the making of new ocean contracts is much less active than it was.

The principal railroads of England make it a rule to issue their new timetables on the first day of the month, and at no other time; and, if we remember correctly, this has been the custom for many years, a custom obviously to the decided benefit and convenience of the public. But it has remained for one company, the London & South-Western, after all these years' experience, to get its new timetables ready for the public a good length of time (five days) in advance of the time they are to go into effect. It is said that hitherto the tables have not been available until the last day of the preceding month or the first or second day of the new month. As most of the railroads on this side of the water have as yet been unable to adopt the first part of this improvement—the regular date—we are hardly warranted in reproaching the English for being slow in adopting the second part. Indeed, a good many American roads seem to find it difficult to get out their tables more than one day in advance.

## TECHNICAL.

### Manufacturing and Business.

Henry James Kimman, Mechanical Superintendent of the Standard Pneumatic Tool Co. of Chicago, sailed for England on Oct. 21 to superintend the installation of machinery in the works of the International Pneumatic Tool Co. at Chippenham. This company recently bought the right to make and sell "Little Giant" pneumatic tools and appliances in the British Empire. After concluding his work in that country, Mr. Kimman intends to make a tour of inspection and instruction among the agencies of the Standard Pneumatic Tool Co. in Paris, Brussels, Berlin, Dusseldorf, Vienna and Amsterdam. He will be absent about three months.

The Baltimore & Ohio is offering for sale 34 spans of bridges which have been replaced by heavier ones. A list may be had by applying to E. H. Bankard, Purchasing Agent, at Baltimore, Md.

Hyde Bros. & Co. of Pittsburgh, Pa., are offering for sale for immediate shipment 75 32-ft. gage dump cars. About one-fourth of the lot are 1¼ yd. capacity and the balance from 2 to 3 yds. capacity; part are turntable and part side dump.

The Union Central will want some rails in about 60 days. (See Railroad Construction Column.)

New Orleans papers report that the Southern Pacific is to discontinue the employment of train agents (collectors) on passenger trains.

The Railroad Supply Co., of Chicgo, is now shipping 2,000 Hein double automatic steel car couplers (10 carloads) to the Denver & Rio Grande.

The Wartrace & Lynchburg RR. Co., an electric railroad, recently incorporated in Tennessee with a capital of $175,000, wants 50,000 cross ties. Address J. Y. Garlington, Lynchburg, Tenn. The road is to be standard gage and equipped for heavy freight service.

### Iron and Steel.

The Union Steel Co. is reported formed by A. W. Mellon, R. V. Mellon and W. H. Donner, with a preliminary capital of $1,000,000, later to be increased to $10,000,000. The company proposes to make rods, wire and nails. The probable site of the plant is at Webster, Pa.

Jacob S. Coxey of Masillon, O., is said to be interested in a steel company about to be established in Ashtabula, O.

Reports state that new steel mills will be built at Fairport Harbor, a few miles east of Cleveland, O. One hundred thousand acres of land are said to have been secured, with a frontage of 4,500 ft. on the river. The company will be known as the Holly Steel Co., and will be capitalized at $5,000,000.

The Cambria Iron Co. is about to take up 212 acres of additional land in the township of Buffington, Indiana County, Pa.

Reports state that capitalists are negotiating for a large tract of land in Eddystone, Pa., on which it is proposed to build an iron plant.

The Blue Mountain Iron & Steel Co. of Maryland has been organized and has secured control of the Catochin Iron tract in Frederick County, about 60 miles west of Baltimore. This company contemplates extensive improvements which include building a new steel plant. Jerome Kelley of Philadelphia is President and Abraham Sharp, Treasurer.

Reports from Pittsburgh, Pa., state that the Tide Water Steel Co. has been formed and will take over the old Wellman steel plant at Chester, Pa., which has been shut down for several years. W. D. Crawford of Pittsburgh is reported interested.

The contracts for the machinery to be used in the new dry docks of the Boston Navy Yard have been let. The Prindle Pump Co., of New York, has an order for three centrifugal pumps, each with a capacity of 35,000 gallons per minute; also a contract for boilers of 2,000 H. P. and engines of 600 H. P. The Westinghouse Electric Mfg. Co. has the contract for the electrical equipment, which include direct-current generators and 300 kw. motors. The whole contract amounts to $140,000.

The Vulcan Iron Co., Ltd., at Newcastle, Pa., has been succeeded by the Vulcan Foundry & Machine Co., of which J. S. Kaufman is President.

The A. & P. Roberts Co. has started work on an additional 35-ton open hearth furnace.

The Mariette Iron Works Co. has been incorporated in Wisconsin with a capital of $75,000. T. E. Miller, S. P. Colby, H. L. Prescott and others, incorporators. The company will carry on a general foundry and machine business.

The Pennsylvania Steel Co., according to report, has a contract with the Cuba Steel Ore Co., of Cuba, for building a steel ore pier 1,000 ft. long, the pier to be built 30 miles west of Santiago. This contract includes all bridges between the pier and the ore mines, a distance of about 10 miles.

### Motor Driven Lathe.

We have received a description of a 28-in. swing screw cutting engine lathe driven by "Bullock" Type "N" Motor placed directly on the spindle in the head stock, taking the place of the cone pulleys. The armature spider is built directly on the hollow spindle of the lathe. By a new system of variable speed control there is a range of sixteen speeds in either direction, including the back gear. The controller is placed on the leg of the lathe directly under the head stock, and is operated by a splined shaft running along the bed of the lathe, and a handle which travels with the carriage. The slowest speed is 60 and the highest about 250 revolutions.

### Large Orders for Rails.

Reports during the past week estimate that orders for fully half a million tons of rails were placed within the last week or so in spite of the high prices prevailing. The quantities said to have been ordered by various large roads are reported as follows: Pennsylvania, 105,000 tons; Illinois Central, 50,000 tons; Chicago & Northwestern, Union Pacific, Chicago, Milwaukee & St. Paul and Baltimore & Ohio, 40,000 tons each, and the New York Central, 35,000 tons. Most of these orders are said to have been made at $33 a ton. The price advanced to $35 on Saturday. The Pennsylvania's order is reported distributed among the following companies: Cambria, Carnegie and Pennsylvania, each about 25,000 tons; Federal Steel, 20,000 tons, and Lackawanna Iron & Steel Co., 10,000 tons. The Reading Railway ordered 25,000 tons some weeks ago with the Pennsylvania Steel Co. at $28 per ton. It is understood that the Lehigh Valley has also made a large order.

### American Locomotives for England.

The latest Baldwin Locomotive Works pamphlet on Recent Construction has something to say about the early shipment of locomotives from this country to England. Locomotives were built for English railroads in 1840 in the shops of William Norris & Co., now a part of the Baldwin Works. The pamphlet has a picture of one of the engines built at that time to work the Lickey Incline of the Birmingham & Gloucester Railway, now part of the Midland. On this incline, nearly three miles long, there is a 2.7 per cent. grade. Four locomotives were sent out to work it, all of the Norris design. There were a single pair of driving wheels forward of the firebox and a four-wheel leading truck. The cylinders were 10½ in. diam. x 18 in. stroke, outside connected. The drivers were 48 in. diam. and the engine weighed about 21,500 lbs. The locomotive "Philadelphia," shown in the engraving, one of the four sent out, is said to have hauled a train of loaded wagons weighing 74 tons up the grade of 2.7 per cent. at a speed of 9¾ miles an hour.

The same pamphlet has pictures and general dimensions of recent engines built by the Baldwins for foreign service, including a mogul for the Midland, a mogul for the Burma Railways Company, a six-coupled double ender for the Imperial Railways of North China, a mogul for the same line, a four-coupled double ender for the Brahestad Railway of Finland, a consolidation engine for the Mexican Railway and a consolidation for the Baturité Railway of Brazil.

### M. C. B. Modifications of Standards.

As a result of the letter ballot certain of the Standards and Recommended Practice of the Association were modified as follows:

Standards.

Sheet 2.—Size of bolt holes changed to $1\frac{1}{16}$ in.
Sheet 1.—Size of bolt holes changed to $1\frac{1}{16}$ in.
Sheet 7.—Addition of axle with journal 5½ in. x 10 in., and the designation of the different standard axles by a letter.
Sheet 11.—Extension of contour lines; modification of standard limit gage; change in radius of yoke; additions to the illustration of the automatic coupler.
Sheet 15.—General dimensions only for journal bearing given.

Recommended Practice.

Sheet B.—Play of shank of coupler in carry-arm changed to not less than one-half inch on each side.
Sheet C.—Diameter of boring gage 3¾ in. x 7 in., journal changed from $3\frac{15}{16}$ in. to $3\frac{13}{16}$ in. (This is not the result of letter ballot, but the correction of a clerical error.)
Sheet H.—Radius at top of pedestal changed from 50 in. to 5 ft. 0 in. (This is not the result of letter ballot, but the correction of a clerical error.)
Sheet I.—Fletcher journal box lid eliminated and Sheet 1 used to illustrate the twist gage for M. C. B. couplers, gage for worn M. C. B. couplers; location of air brake parts on cars and label for air brake hose.
Sheet K. (new sheet).—Illustration of drop test machine and details for M. C. B. couplers.

These changes and additions have been made and lithographs illustrating the same will be ready for delivery Oct. 30. A complete set of these, consisting of 15 sheets of standards and 11 sheets of recommended practice, are sold at 25 cents a sheet, or $6.50 a set. These pamphlets may be obtained from the Secretary, Mr. Joseph W. Taylor, 667 Rookery Building, Chicago.

### Steel Plates for Australia.

A shipment of 25,000 steel plates for the Coolgardie Water Supply Co., of Australia, has been made by the Glasgow Iron & Steel Co., Pottstown, Pa. The plates are 28 ft. long. The entire weight of the shipment, which will be sent to Australia flat with special machinery for curving them upon arrival there, aggregates 35,000 tons. They are to be used in building an aqueduct 10 miles long to supply Sydney with water. The entire contract was awarded to the Carnegie Steel Company, and about half the plates were rolled in Pottstown.

### A Big Emery Planer.

The increasing size of locomotives has necessitated a change in the emery planing machines used for facing different parts. Owing to this necessity, the Pennsylvania Railroad Company contracted some months ago with the Tanite Company of Stroudsburg, Pa., for building a new and improved emery planer for the Altoona shops. This machine is now in course of construction and will be the largest of the kind yet built, weighing in the neighborhood of a ton and a half. It is a modification of the Newman emery planer used not only by railroads, but by the makers of dies and other case-hardened work.

### Public Works Estimates.

The annual report of Brig.-Gen. John M. Wilson, Chief Engineer, U. S. A., submits estimates for river and harbor works, already authorized by Congress, but not provided for by continuing contracts, amounting to $26,906,821. In addition $15,582,626 is asked to carry on works already contracted for. The detailed estimates recommended for river and harbor work in the waters in the territory contiguous to New York are as follows:

| | | | |
|---|---|---|---|
| East River and Hell Gate | $200,000 | Passaic River, N. J. | $20,000 |
| Harlem River | 500,000 | Staten Island Channel | 10,000 |
| Newtown Creek | 10,000 | Elizabeth River | 2,500 |
| Canarsie Bay | 15,000 | Raritan River | 50,000 |
| Brown's Creek, Sayville | 10,000 | South River | 10,000 |
| Patchogue River | 2,500 | Raritan Bay | 65,375 |
| New York Harbor | 100,000 | Matawan Creek | 3,000 |
| Bay Ridge Channel | 332,000 | Keyport Harbor | 15,000 |
| Gowanus Channel | 20,000 | Shoal Harbor | 15,000 |
| Port Chester Harbor | 5,000 | Shrewsbury River, N. J. | 10,000 |
| Mamaroneck Harbor | 11,000 | Greenwich Harbor, Conn. | 14,000 |
| Larchmont Harbor | 20,000 | Coscob and Mianus | 10,000 |
| East Chester Creek | 2,500 | Stamford Harbor | 12,000 |
| Bronx River | 25,000 | Five Mile River | 5,000 |
| Mattituck Harbor | 25,000 | Norwalk Harbor | 15,000 |
| Port Jefferson Harbor | 33,000 | Saugatuck River | 5,000 |
| Huntington Harbor | 2,500 | Bridgeport Harbor | 50,000 |
| Flushing Bay | 15,000 | Housatonic River | 24,000 |
| Peekskill Harbor | 20,000 | New Haven Breakwater | 100,000 |
| Rondout Harbor | 2,500 | New Haven Harbor | 50,000 |
| Saugerties Harbor | 2,500 | Connecticut River | 20,000 |
| Hudson River | 400,000 | Duck Island Harbor | 25,000 |
| Narrows of Lake Champlain | 17,500 | Thames River | 20,000 |

The estimate for the supervision of New York Harbor next year is $69,200.

### A Large Boiler Contract.

The New York Gas, Electric Light, Heat & Power Co., a consolidation of the electric lighting companies in New York, has let a contract to Thayer & Co. for 56 boilers to work at 225 lbs. pressure; the total capacity will be 39,000 h. p. This is part of the equipment for the new generating station now building in First Ave., between 38th and 39th Sts., which will cost fully $500,000. These boilers will be made by the Aultman-Taylor Co. of Mansfield, O. The contract calls for delivery within two years.

### Electric Car Heater Patents.

In the suit of the Consolidated Car Heating Company against the Palmer & Monson Street Railway, which road uses the Gold electric heaters, the Circuit Court of the United States for the District of Massachusetts has dismissed the bill of complaint. This suit was for infringement of patent No. 608,211.

### Dredging Bids Wanted.

Proposals will be received at the U. S. Engineer office in Galveston, Tex., until 2 P.M., Nov. 15, for deepening the channel from Galveston Harbor to Texas City, Tex. Information can be had of C. S. Riche, Captain of Engineers.

### Interlocking on the New York Central.

The Standard Railroad Signal Company has taken contracts to put in low pressure pneumatic interlocking apparatus for switches and signals for the York Central & Hudson River road at Suspension Bridge and at Hoffmans. At Suspension Bridge the machine will have about 76 "levers." Hoffmans is the new junction where connecting tracks are being built to facilitate the passage of freight trains between the New York Central freight tracks and the West Shore road. It is proposed to run freight trains from the west as far as Hoffmans on the New York Central and thence to Weehawken over the West Shore. The interlocking at this place will be about two-thirds as large as at Suspension Bridge. The New York Central has lately completed mechanical interlocking plants at Athens, Kirkville and Byron.

### The League Island Dry Dock Contract.

The contract for building the naval dry dock at the League Island Navy Yard near Philadelphia, Pa., was awarded Oct. 23 to the Atlantic, Pacific & Gulf Construction Co. on the new specifications. This company has the contract for the dry dock to be built at Mare Island, California. Congress provided for the construction of a timber dock at League Island, but the Navy Department decided that a masonry dock will be better. As the award was made on a proposal for a timber dock, an additional amount will be allowed to enable the company to build a masonry dock if Congress grants the neces-

## THE SCRAP HEAP.

### Notes.

The New England Transfer Elevator at Forty-eighth Street, Chicago, was destroyed by fire Oct. 19. Estimated loss, $100,000.

According to newspaper reports, a line of auto-

mobiles is to be run in Atlantic City, N. J., to compete with street cars. It is said that Mr. Wolverton, President of the New York Transfer Co., is at the head of a company which has ordered 60 vehicles for use in Atlantic City. Each coach will carry 22 passengers. It is also reported that the New York Central has ordered 50 automobiles. At present the Central runs passenger carriages, we believe, in only one city, New York.

Cars are now being operated by the Third Avenue Railroad, New York City, from Sixty-fifth St. to the Harlem River by the underground electric system. The work of removing the cable from the conduit was begun at two o'clock last Sunday morning and was not finished until about three in the afternoon, during which time no cars were operated.

**The American Car & Foundry Co.**

The last quarterly statement of this company shows receipts and expenses as follows:

| | To Aug. 31. | To May 31. |
|---|---|---|
| Gross earnings for three months .. ....| $10,333,176 | $8,154,796 |
| Cost materials, operating expenses, etc. | 9,102,264 | 8,498,979 |
| Applicable to dividends ..... ..... | $930,912 | $658,817 |

The surplus on hand Aug. 31, after paying the dividend of July 1 on the preferred stock, was $1,080,374.

**The Blackwell's Island Bridge, New York.**

Bridge Commissioner John L. Shea is reported as saying that the work of building a bridge across the East River from the Borough of Manhattan, N. Y., to Ravenswood, Long Island City, will begin as soon as Corporation Counsel Whalen has determined whether the Board of Public Improvements or the Municipal Assembly has the final approval of the work before it goes to the Secretary of War.

The proposed bridge will be 2,710 ft. long between shore lines, and be 150 ft. wide. It will accommodate two railroad tracks, two double tracks for trolley lines, paths for bicycle riders, two foot walks, two roadways for heavy teams, and also roadways for lighter vehicles. It will be of iron and steel, and the height of the roadway above the pier line will be 122 ft., with an increasing elevation to 135 ft.

From the terminal in New York City the bridge will extend over a series of arches to the East River front. Then a cantilever span of 1,050 ft. will be built. Next comes a cantilever span of 600 ft. across Blackwell's Island, and a span of about 900 ft. across Hell Gate. The foundations, which will be concrete and stone, will rest on solid rock. The main pier in Manhattan will be 115 ft. high, and the height of the pier on Blackwell's Island will be 118 ft. Additional approaches can be built, one from Astoria and another from Hunter's Point. The estimated cost is divided about as follows: Land in Manhattan, $1,485,000; land in Queens Borough, $573,000; main bridge, $1,392,000; approach in Manhattan, $930,000; approach in Queens Borough, $1,360,000; total, $5,740,000. If building is begun simultaneously on the Manhattan side, on Blackwell's Island and on the Long Island side, it is expected that it can be finished in two years.

**City Wastes.**

A novelty appears in the announcement of the "City Waste Disposal Company." This company is organized from the staff of the late Colonel Waring, with headquarters in New York City. The announcement is that the company is prepared to consult and make contracts in matters of sewage disposal, street cleaning and disposal of garbage and refuse. The company undertakes to remove suspended and dissolved organic impurities in sewage and to discharge the water purified to a drinking water standard if desired. This is accomplished by natural oxidation without the use of chemicals. All the sludge is converted into soluble and innocuous salts. The matters of garbage disposal and street cleaning are, of course, to a large degree, special in each case, and to these the company is prepared to bring the results of a large and successful experience.

**Railroads in China.**

The Peking Electric Tramway, from the railroad terminus to the city wall, was opened the first week in July. The restrictions on luggage carried and the infrequency of the service are said to be very serious handicaps on the usefulness of the line.

It is said that Sir John Wolfe Barry, K. C. B., has been appointed Consulting Engineer to the Imperial Railways of North China. This, it will be remembered, is the organization of which Mr. Kinder is Chief Engineer and General Manager.

The French Government has consented to loan to China five million taels at 7 per cent. interest to build a railroad on the Kuangsi-Annam borders.

Notes from Hankow say that work is progressing well on the Lu-Han Railroad. The officials are polite and the country people quiet. There will be one pretty hilly district of 36 miles with a tunnel of 400 yards and numerous small bridges. One bridge will be 275 yards long. The line is staked out for 110 miles. The work will be immediately pushed on the Sinyang, the starting point of the English line to Nanking. The Yellow River bridge will be 2½ miles long. A single track is built, but the masonry is arranged for a double track.

The Chittagong-Assam Railroad is to be extended from the Ledo through the Hukong Valley into Burma and a bridge is to be built over the Irawaid at Sagiang. Thus the Indian and Burmese railroads are to be connected and a locomotive will be able to run from the western boundaries of India to the borders of China.

The Governor of Peking recommends the building of a railroad between Peking and the western Hills, a short distance from the capital, to bring in coal. This coal is now used by the entire population of the capital and is carried by camels and mules. Naturally, the quantity used is small and the cost high. An imperial decree has been issued commanding the Governor to instruct his foreign engineers to survey and report on this line.

**Iowa Car Coupler Law.**

It is reported that the various railroads of the State of Iowa will appeal to the legislature at the coming session for another extension of the time when all freight cars must be equipped with automatic couplers. This statute as first passed required all freight cars to be so equipped by the first of January, 1899. The last legislature extended the time until January, 1900. It will be impossible for the railroads to have all the cars equipped with the couplers by the first of January, owing to the fact that they are now unable to secure sufficient couplers, the demand being far ahead of the supply. About seventy-five per cent. of the cars of the railroads of the state have been equipped and the remainder will be so equipped as soon as the couplers can be secured. This will probably take six to nine months longer than first anticipated, and the general impression is that the legislature will grant the request for longer time.

**Mexican International Bridges.**

The Phoenix Bridge Co. of Phoenixville, Pa., has a contract with the Mexican International Ry. for bridges at Nazas, Cuencame, Pericena, Pozuelas, Tlahualilo Canal and shops at Diaz. These bridges vary in length from 60 ft. deck plate girders to 180 ft. through spans for the crossing of the Nazas River.

**Dinner Given to the Governor of Yucatan.**

On October 3, a dinner was given to Gen. Francisco Canton, the Governor of Yucatan, by Thornton N. Motley and James M. Motley of Thornton N. Motley & Co. Among the guests were G. M. Brill, President of the J. G. Brill Co., and officers of several steamship companies.

**Last Tubular Spans on the Grand Trunk.**

The Grand Trunk Ry. during the past few months has been double tracking the line between Vaudreuil and St. Annes stations, Quebec, a distance of four miles, building at the same time double track bridges in place of former single track structures across the two branches of the Ottawa River at Vaudreuil and St. Annes, the intervening space being an island known as Ile Perrot. The rebuilding of the bridge at St. Annes has done away with the last tubular span bridge on the line of this company.

**The New Cambridge-Boston Bridge.**

The new Cambridge bridge, to replace the old West Boston bridge over the Charles River, will have a steel superstructure on stone piers. It will be 105 ft. wide and 26 ft. high above mean high water. The approaches on Main St., Cambridge, and Cambridge St., Boston, will be widened in proportion to the width of the bridge. The Boston Elevated RR. will cross the bridge on the surface and reach the grade nearly on a line with the embankment. The new channel will be in the center of the bridge. There will be three spans on each side of the center spans, the design of which is yet undecided. Petition will be made to Congress for a drawless span. Work will be begun this winter on the foundations. Work on the bridge proper will be started at both ends and continued up to the draw section, by which time it will be known whether there will be a draw or not. The temporary wooden bridge west of the old bridge is 2,568 ft. long and will soon be opened.

**Dredging in Delaware.**

The U. S. Engineer at Wilmington, Del., received the following bids for dredging a 21-ft. channel in the Christiana River and for building jetties at the mouths of the Christiana and Brandywine Rivers, and extending the jetty to the north of the mouth of the Christiana River: B. F. Sweeten, north jetty, $28,876; south jetty, $34,147.20; Delaware Construction Co., north jetty, $30,494; south jetty, $42,000; American Dredging Co., dredging 11⅞ cents per cu. yd.; Philadelphia Construction Co., dredging, 10⅝ cents per cu. yd.; Brown Hydraulic Co., dredging, 13⅝ cents per cu. yd.; Atlantic, Gulf & Pacific Dredging Co., 13⅝ cents per cu. yd.; B. T. Collins, south jetty, $53,572; Brandywine, $7,310.80; American Artificial Stone Paving Co., south jetty, $4,300; Brandywine, $9,500; Franklin D. Wells, Brandywine, $8,202.89; P. Sanford Ross Incorporated Co., north jetty, $28,375; south jetty, $34,325.95; Brandywine, $6,950; Sanford & Brooks, north jetty, $31,800; south jetty, $33,681.50; Brandywine, $7,900. All bids were referred to the Treasury Department.

**An Opinion of Buffet Cars.**

. . . While on the subject of travellers' luncheons, it may be added that there has been noticed a growing tendency among even parlor-car travellers to carry little hampers of luncheon on their journeys. This is particularly the case where the train is provided with buffet service. The uniformly slow, high-priced, unsatisfactory meals that seem inseparable from this service make the frequent traveller on trains where it is used prefer his own luncheon-box.—Evening Post (New York).

**The Havana Traction Co.**

The Havana Traction Co., which was incorporated several months ago in New Jersey to build electric railroads in and about Havana, Cuba, completed its organization last week with the election of the following Directors: Sir William C. Van Horne, Canadian Pacific Railroad Co.; Peter A. B. Widener, Philadelphia; Geo. A. Cox, President, Central Canada Loan & Savings Co.; William L. Elkins, Philadelphia; William Mackenzie, President Toronto Railway Co.; Thomas F. Ryan, Newark, N. J.; Frederick Nicholls, Vice-President and General Manager Canadian General Electric Co.; Thomas Dolan, Philadelphia; Zebulon A. Lash, Toronto; Henry F. Booth, Byron E. Walker, General Manager of the Canadian Bank of Commerce; Juan C. Bellows, Robert A. C. Smith, New York; A. E. Ames, Vice-President National Trust Co.; William A. Barber, Paterson, N. J. Subsequently at a meeting of the Board of Directors officers were elected: President, Sir William C. Van Horne; Vice-President, P. A. B. Widener, and Secretary, J. C. Bellows.

**Creosoted Bridge Timber.**

The Rush St., Chicago, Ill., bridge which forms the only direct connection between the Boulevard systems of the North and South divisions of the city, as well as being used for a heavy teaming traffic, is probably used more than any other bridge in Chicago. It is being extensively repaired, the present timbers being replaced with yellow pine creosoted timbers and the roadways paved with creosoted blocks. As this is the first piece of this pavement to be laid in Chicago such a test of it will be of interest. The creosoting has been done by the Republic Chemical & Creosoting Co., with offices in the Chamber of Commerce Bldg., Chicago. The retaining walls at the ends of the bridge are also being repaired. As there is a double roadway, all the work is being done without closing the bridge to traffic, by working on one side at a time.

**Chicago Drainage Canal.**

The difference between the City of Joliet and the Trustees of the Chicago Sanitary District were settled Oct. 16 by the City Council of Joliet passing almost unanimously an ordinance binding Joliet to take no action that will delay the completion of the channel. In return the Drainage Board agrees to pay the entire cost of the Jefferson and Cass St. bridges and to put the Jackson St. bridge in good condition. The questions of the quality of work on the bridges and the building of a retaining wall between Jefferson and Cass Sts. are left to arbitration. The ordinance has been accepted by the Drainage Board. This settlement removes the most serious obstacle to the opening of the channel in December next.

**The Franklin Institute.**

The Bulletin for the current month announces a stated meeting of the Institute to be held Wednesday, Oct. 18, at 8 P. M. Mr. Strickland Kneass will read a paper on "Giffard's Invention and the Development of the Self-Acting Injector." This paper will give a historical sketch of the evolution of the steam injector, with illustrations of various forms of apparatus. A paper will also be presented by Mr. William B. Wait, Superintendent of the New York Institute for the Blind, on "An Apparatus for Embossed Printing for the Use of the Blind." Arrangements have been made for the popular lectures of the Institute to be held in Association Hall, Fifteenth and Chestnut Sts., under the joint patronage of the Central Branch Y. M. C. A. and the Franklin Institute.

**A Railroad Academy.**

A new institution called a "Commercial and Railroad Academy" was to be opened at Luiz, in Austria, Oct. 1, the railroad instruction being in accordance with plans of the Austrian Railroad Club. Special attention is to be given to practical exercises. The course extends over three years. In the first, a study is made of goods and materials, with a view to their classification; of the telegraph, the telephone and signaling, with practice in telegraphing. In the second year the subjects are traffic, geography and history, railroad technology, more telegraphy, practice in signaling, traffic service with practice, and transportation service with practice. In the third year, traffic statistics, railroad law, practice in classification of goods in connection with the application of rates, traffic service, with practice; transportation service, with practice; railroad bookkeeping and accounting, with practice; the theory of railroad rates, and customs regulations. These are the strictly technical subjects; there being other general studies. The graduates will for the most part enter train and station service. The Austrian Railroad Club long maintained a school of its own in Vienna of more limited scope.

**Deformation of Metals by Punching and Shearing.**

(From Abstracts of Papers, etc., Inst. C. E., London.)

It has usually been assumed that in punching a plate the various layers, originally parallel, suffer parallel deformation, which is contradicted by the fact that the pieces punched from a round hole usually show a circular ridge about the middle. Mr. C. Frémont prepared a few pieces of iron plate 4 in. wide and 8 in. thick, each plate was stamped seven times with a punch, the penetration being successively increased until, at the seventh impression, a complete hole was formed. A longitudinal section through the seven depressions was then made, the section polished and etched to show more clearly the direction of the fibres. The superficial layers of the plate are subjected principally to a shearing strain, while on the middle layers a tensile strain seems to be the most important. The surface of fracture is not cylindrical, but is formed by a pair of conical surfaces, the smallest diameter corresponding with the middle of the plate. The phenomena exhibited by the punching of a solid plate differ from those obtained from a series of thin plates, in which the various layers are free to slide on each other.

## LOCOMOTIVE BUILDING.

The Fitchburg will probably soon be in the market for engines.

The Great Northern is in the market for about 20 locomotives.

The Minneapolis, St. Paul & Sault Ste. Marie is about to order 10 locomotives.

The Central Vermont is considering ordering some new locomotives, probably 20.

The Brooks Locomotive Works will build two engines for the Carnegie Steel Co.

The Baldwin Locomotive Works are building one engine for the Arizona & New Mexico.

The Baldwin Locomotive Works are building one engine for the Esquimalt & Nanaimo.

The Chicago Junction has ordered two engines from the Schenectady Locomotive Works.

The Northern Pacific is about to order some locomotives; the number is given as 25.

The Baldwin Locomotive Works have an order to build one engine for the Alabama & Vicksburg.

The Schenectady Locomotive Works have received an order to build two engines for the Maine Central.

The Waiaka Agricultural Co., of Hawaii, is having one engine built by the Baldwin Locomotive Works.

The West Virginia Central & Pittsburgh recently ordered one engine from the Baldwin Locomotive Works.

The Union Central, with office at Kansas City, Mo., will want some rolling stock in about 60 days. (See Railroad Construction column.)

We understand that the Illinois Central is figuring with the Brooks Locomotive Works and Rogers Locomotive Co. on 40 new engines.

We understand that the Atchison, Topeka & Santa Fe is building at its Topeka shops two tandem compound locomotives, with 77-in. drivers, for fast passenger service, from designs made by Mr. John Player, Superintendent of Motive Power.

Published reports in reference to an order given by the El Paso & Northeastern to the Baldwin Locomotive Works for new locomotives, refer to four 21 in. x 26 in. cylinder consolidation engines ordered some months ago for shipment early next year.

The New York Central & Hudson River has asked bids for building 90 locomotives, 15 of which will be 10-wheel passenger, 25 six-wheel switching and

50 moguls. The passenger engines will have piston valves and five of the moguls will have Vanderbilt corrugated boilers.

In addition to the information published last week with reference to the 12 compound consolidations ordered by the Canadian Pacific from the Richmond Locomotive & Machine Works, the specifications call for charcoal iron tubes, Westinghouse brakes, steel axles, M. C. B. couplers, C. P. standard headlights, two No. 10 Gresham & Craven restarting injectors, Richardson safety valves, Leach sanding devices, Michigan lubricators, Crosby steam gages, open hearth steel driving wheel tires, cast iron truck and tender wheels, and cast iron driving wheel centers.

The Richmond Locomotive & Machine Works have received an order to build 10 ten-wheel passenger locomotives of 5 ft. gage for the Finland State Railways. This is the second order for locomotives received from this road. The engines are for delivery in April, 1900, will weigh 90,000 lbs., with 65,000 lbs. on the driving wheels, and have 16 in. x 24 in. cylinders; 62 in. driving wheels; radial stay straight top boilers, with 170 brass tubes 2 in. in diam. and a working steam pressure of 180 lbs.; fireboxes, copper, 56¾ in. long and 37 in. wide; and a tank capacity for 2,100 gals. of water.

The Chicago, Indianapolis & Louisville has ordered four simple 12-wheel freight locomotives to be built by the Brooks Locomotive Works for delivery late in March or early in April, 1900. These locomotives will have 21 in. x 26 in. cylinders and drivers 54 in. in diam. The boilers will be of the Belpaire type, with a working steam pressure of 200 lbs. There will be about 300 tubes 2¼ in. diam. and 13 ft. 10⅜ in. long. The fireboxes will be of Carbon steel, about 120 in. long and 41¼ in. wide. The special equipment will include Trojan couplers, Brooks Locomotive Works' valve rod packing, Consolidated safety valves, Leach sanding devices, Detroit sight-feed lubricators with Tippett attachments, French springs, and cast steel driving wheel centers. Cast iron truck wheels, spoke pattern with chilled treads, and cast iron tender wheels, plate pattern with chilled treads, will be used. The engines will also be equipped with the most improved type of piston valves, U. S. bronze driving boxes, nickel steel piston rods and nickel steel hollow crank pins.

The order for 20 mogul locomotives for the Chicago, Burlington & Quincy, noted last week, was placed with the Rogers Locomotive Co. and not with the Richmond Locomotive & Machine Works, as stated. They are for delivery in February and March, 1900, and will be simple engines with cylinders 19 in. x 26 in. and drivers 64 in. in diam., and will weigh 141,000 lbs, with 120,000 lbs. on drivers. The boilers will be of the Belpaire type, 62 in. in diam. at the front end of shell and 68 in. at back of shell, and will carry 200 lbs. working steam pressure. There will be 291 charcoal iron tubes 2 in. in diam. and 12 ft. 6 in. long. The fireboxes will be of steel, 9 ft. long and 3 ft. 4 in. wide. Tank capacity for water will be 5,000 gals., and coal capacity nine tons. The locomotives will be equipped with Westinghouse air brakes, steel driving axles, Hawksworth air bell ringers, Ross-Mehan brake shoes, Chicago couplers, 18-in. Rochester headlights, Ohio injectors, Jerome metallic piston and valve rod packings, Leach sanding devices, French springs and Star Brass Co.'s steam gages. The brake beams, safety valves and sight-feed lubricators are optional with the builders, and Standard wheels will be used for the engine trucks.

## CAR BUILDING.

The Boston & Albany will shortly issue specifications for from 300 to 500 box cars.

The Jackson & Sharp Co. has received an order for 100 double-deck electric cars for Paris.

We are officially informed that the Northern Pacific is not in the market for freight cars.

We are officially informed that the Wisconsin Central will rebuild no cars at its Waukesha shops.

It is reported that the Duluth, Missabe & Northern will buy about 25 box, furniture and stock cars.

We are reliably, but not officially, informed that the Cleveland, Lorain & Wheeling will order 200 box cars.

The Norfolk & Western has ordered from the American Car & Foundry Co. 200 coal and 500 stock cars.

We are officially informed that nothing definite has been decided about new freight cars for the Mobile & Ohio.

It is reported that the South Side Elevated, Chicago, will place orders during the coming winter for about 50 cars.

The Missouri Pacific has placed an additional order with the American Car & Foundry Co. for 1,300 box cars of 60,000 lbs. capacity.

The Davenport, Rock Island & Northern has placed an order with the Barney & Smith Car Co. for 10 flat, 20 box, and 20 gondola cars.

In addition to the cars already referred to, the Baltimore & Ohio has ordered 1,000 box cars from the South Baltimore Car Works.

The Union Central, with office at Kansas City, Mo., will want some rolling stock in about 60 days. (See Railroad Construction column.)

The 1,000 box cars for the Southern Pacific, referred to in our issue of Oct. 13, have been ordered from the Barney & Smith Car Co.

The Delaware & Hudson Canal Co. has placed an order with the American Car & Foundry Co. for 300 more coal cars of 80,000 lbs. capacity.

The Lehigh Valley has placed an order with the American Car & Foundry Co. for 2,750 box cars of 60,000 lbs. capacity, and 250 flat and 300 coal cars of 80,000 lbs. capacity.

It has been reported that the Missouri, Kansas & Texas would order several hundred cars, but we are officially informed that the road is not contemplating buying additional equipment, at least for the present.

The Illinois Central order for cars for passenger service, noted Oct. 13, is for nine chair cars and two dining cars from the Barney & Smith Car Co., and six composite cars, six baggage cars and 15 coaches to be built by Pullman's Palace Car Co.

The Pennsylvania has placed an order with the American Car & Foundry Co. for 2,000 box and 1,500 coal cars of 80,000 lbs. capacity, and with Pullman's Palace Car Co. for 1,000 box cars. A large number of freight cars will probably also be built at the shops of the road.

The Philadelphia & Reading has ordered 1,000 King hopper coal cars, of 60,000 lbs. capacity, from the American Car & Foundry Co., to be built at the Detroit works, and 300 cars of the same class from the Middletown Car Works. These are in addition to the 1,000 cars from the American Car & Foundry Co. and from the Lebanon Mfg. Co. referred to in recent issues.

The Boston & Albany has placed an order with the Jackson & Sharp Co. for 13 first-class passenger coaches, five smoking cars, five baggage cars and one combination car, for delivery in March or April, 1900. The cars are to be vestibuled, with Gould vestibules and steel platforms, Consolidated Car Heating Co.'s heating system, Pintsch gas and Scott springs.

The 25 flat cars ordered by the Brainerd & Northern Minnesota from the Mt. Vernon Car Mfg. Co., as noted last week, will be of 75,000 lbs. capacity and weigh 28,000 lbs. They will be 40 ft. 2 in. long, 9 ft. 4 in. wide and 42 in. high. Their equipment will include Westinghouse air brakes, diamond trucks with Bettendorf bolsters, steel axles, Sterlingworth brake beams, Tower couplers, French springs, McCord journal boxes and lids, Soule dust guards and double twin spring draft rigging.

The New York Central & Hudson River will order 50 first-class passenger coaches to be about 60 ft. long, without vestibules, and equipped with six-wheel trucks, and has placed an order with the American Car & Foundry Co. for 500 flat cars of 60,000 lbs. capacity, 4,000 twin hopper coal cars of 80,000 lbs. capacity, and 5,000 box cars of 60,000 lbs. capacity. The cars will all measure 35 ft. long and have Fox trucks with pressed steel bolsters and National hollow brake beams and Gould couplers. No special makes of journal boxes, journal box lids or springs have been specified. The box cars will have Security doors and Cleveland-Chicago '92 roofs.

## BRIDGE BUILDING.

ALTOONA, PA.—The Council has authorized a committee to confer with the railroad regarding the proposed Twenty-fourth St. bridge.

ATLANTIC CITY, N. J.—Reports state that the Philadelphia & Reading contemplates the removal of the grade crossing of the West Jersey & Seashore RR. in Atlantic City.

AUBURN, PA.—The Schuylkill County Court has been petitioned for viewers for a new county bridge between the tracks of the P. & R. and the Pennsylvania near Auburn.

BAKERSFIELD, CAL.—A bridge across the Kern River, near Kern City, is in consideration. It will probably cost $2,500. C. F. Fairchild is one of the viewers.

BATAVIA, N. Y.—At the November election it will be decided whether $3,000 shall be appropriated for a bridge over Tonawanda Creek. John W. Davis, County Auditor.

BINGHAMTON, N. Y.—Reports state that the Railroad Commissioners have ordered the proposed viaduct built across the tracks of the Erie and the New York, Lackawanna & Western (D., L. & W.) railroads at Chenango St. The general dimensions of this structure were given in this column Oct. 6, p. 698. Edward C. McEntee, Assistant Secretary, Board of Railroad Commissioners.

BLACKSBURG, S. C.—The South Carolina & Georgia railroad bridge over the Broad River, two miles south of this place, was destroyed by fire last week.

BRIDGEPORT, CONN.—The plans for improvements by the New York, New Haven & Hartford in this place include a large viaduct and a four-track draw-bridge; also a new depot.

BRISTOL, CONN.—It has been decided to eliminate the grade crossing at Main St. N. E. Pierce, Town Attorney.

BUFFALO, N. Y.—Proposals will be received at noon on Oct. 26, by Erastus C. Knight, Comptroller, for $75,455.35 of 3½ per cent. grade crossing bonds.

CARLTON, N. Y.—Proposals were received Oct. 25 by Robert Warren, Town Supervisor at Kent, N. Y., for $14,000 of bridge bonds.

CENTRE, ALA.—The Commissioners' Court for Cherikee County has let a contract for a new steel bridge across Coosa River at Cedar Bluff. It will have three spans, 100, 220 and 109 ft., respectively, and 1,000 ft. of approaches and will cost $27,500.

CHESTER, PA.—A bridge will probably be built at the railroad crossing on Wilson St. It is stated that plans have been prepared.

CHICAGO, ILL.—The Council Committee on Harbors, Bridges and Viaducts has received a report from Commissioner McGann and City Engineer Ericson, stating that $3,110,000 is needed to repair bridges, and $10,000 is needed to prepare new plans. The committee during the latter part of last week made trips up the North Branch, the South Branch and along the Calumet to decide what bridges need repairing. A list of the new bridges needed and those needing repairs was given Oct. 13.

Reports state that business firms in Division St. and Goose Island propose to build bridges over the Ogden Canal and across the river in Division St.

The Panhandle and St. Paul railroads and the Union Traction Co. have agreed to repair the Desplaines St. viaduct.

CINCINNATI, O.—The $10,000 of 3½ per cent. bridge bonds which will be sold on Nov. 4 by Hamilton County, are for the Ross Run bridge in Middle Creek Township. Geo. C. Zimmermann, Clerk, Board of County Commissioners.

CLAYTON, CONN.—The New York, New Haven & Hartford, according to report, has decided to abolish two grade crossings at Clayton, the highways to pass under the railroad tracks. The cost of the improvement is estimated at $60,000.

CLEVELAND, O.—Bids will be received at the office of Charles P. Salen, City Auditor, until noon of Nov. 18, for $100,000 4 per cent. City of Cleveland bridge bonds. This money will be used mostly for repairing and rebuilding. No new bridges will be built. George P. Kurtz, City Treasurer.

It is reported that the Pennsylvania RR. proposes to abolish the grade crossing at Holton St., Cleveland.

COHOES, N. Y.—The State Board of Railroad Commissioners has ordered the crossing of Ontario St. and the Delaware & Hudson Co. abolished. This will necessitate an overhead viaduct.

COLORADO SPRINGS, COLO.—The Council is considering for next year's estimates, $12,000 for a new bridge over the Huerfano River at Monument.

COLUMBUS, GA.—We are told that there is no truth in the report that the city contemplates building bridges.

COLUMBUS, MISS.—The Clerk of the Court of Loundes County has been ordered to advertise for bids for bridges over McGowan Creek and Cachura Creek on Macon road. Bids will be opened at November (Tuesday after first Monday) meeting of Commissioners.

CORVALLIS, ORE.—The Commissioners' Court met on the 21st to consider the question of Long Tom bridges, which the Government engineers require to be replaced by either ferries, drawbridges or high bridges, so that the river may be open to navigation as far as Monroe.

CROOKSTON, MINN.—The City Engineer is preparing plans and estimates for a bridge at Seventh and Main Sts.

DELAWARE, O.—A wooden bridge over the Oleantangy River at William St. was recently burned. An iron structure is contemplated, according to report.

DENVER, COLO.—Engineer Jones has been ordered by the Board of Public Works to prepare plans for a bridge over Cherry Creek at South Fourteenth St. An appropriation of $7,500 has been made for this structure.

A bridge is proposed over the Grand River at Dotsero, according to reports. The estimated cost is about $8,000.

DETROIT, MICH.—Wm. Wormsdorf, Commissioner of Highways of Springwells Township, received proposals on the 25th for the swing bridge over the Rogue River at Fourth St., between Springwells and Ecorse townships. (Oct. 20, p. 733.) This bridge will be 203 ft. long and will have a clear roadway of not less than 18 ft., nor more than 24 ft., and two sidewalks of 4 ft. 6 in. each.

EAST LIVERPOOL, O.—The Penn Bridge Co. is preparing new plans for the proposed East End bridge for the East Liverpool & Wellsville St. Ry. Co. The new plan will be for a bridge about 300 ft. long.

EDDYVILLE, IA.—The Iowa Central Ry. proposes to build a bridge across the Des Moines River at this place. The bridge will probably be composed of seven spans, 140 ft. each in width, and will cost about $100,000.

EPHRATA, PA.—The viewers appointed to consider a bridge across the Cocalico Creek at Bowman's farm reported in favor of an iron structure to be built by the county.

GREAT FALLS, MONT.—The Cascade County Commissioners have decided to build a new bridge at the Hackshaw place across Belt Creek.

IOWA CITY, IA.—The Boards of Supervisors of Johnson and Washington, at a joint meeting, Oct. 18, let a contract for an iron bridge over the highway at Hollands Ferry, to the Newcastle Bridge Co. of New Castle, Ind., at $2,800. (July 21, p. 538.)

KANSAS CITY, KAN.—The Kansas City, Lawrence & Topeka Electric RR. will need a bridge across the Kansas River at Eudora.

KANSAS CITY, MO.—The Metropolitan St. Ry. is contemplating building a viaduct at Sixth St. and Minnesota Ave., Kansas City, Kan., to cost about $10,000. This company recently let a contract for a viaduct on Eighteenth St., the total cost of which, it is said, will be about $150,000.

LAS ANIMAS, COLO.—It is proposed to build an $8,000 bridge across the Arkansas River near Prowers Station. A vote will soon be taken on the question.

LOGAN, UTAH.—The plans and specifications for a bridge over Spring Creek and Little Bear River, on the new road to Mendon, have been adopted and bids are wanted.

LYSANDER, N. Y.—This town recently sold $25,000 of 3½% bonds for bridges.

MADISON, GA.—A railroad proposed by J. H. Holland of this place will need four or five bridges.

MINNEAPOLIS, MINN.—The Park Board has authorized the street railroad company to build a bridge over the tracks at Interlachen.

MORRISTOWN, N. J.—Reports state that the Lackawanna Railroad will probably abolish all the grade crossings in this city. Drafts of plans for this improvement were recently presented to the town authorities.

NAPA, CAL.—The Clerk of the Board of County Supervisors will receive bids until Nov. 14 for a bridge across Suisan Creek in Soscol Road District No. 1. N. W. Collins, Clerk.

NEW YORK, N. Y.—The Committee on Bridges and Tunnels of the Board of Aldermen has reported favorably on bridges over the tracks of the New York & Harlem RR. at 99th, 100th and 101st Sts., on Park Ave.

Sealed estimates will be received until Nov. 1, at the office of the Department of Highways, 21 Park Row, Borough of Manhattan, for completing the abandoned contract for the masonry, steel and plank-deck bridge on the Amboy Road, in the town of Westfield, Richmond Borough.

NIAGARA FALLS, N. Y.—The Michigan Central Ry. has let a contract to the Detroit Bridge & Iron Works at $150,000, for adding a third cantilever truss to the suspension bridge over the Niagara River

between New York and Niagara Falls, Ont. The railroad company will do the necessary work on the foundations. The truss is 190 ft.

NORTHAMPTON, MASS.—The elimination of the Flaherty grade crossing in Hadley is estimated to cost $20,000. The Northampton-Amherst electric railroad will share part of the cost.

OROVILLE, CAL.—W. Jasper, the Commissioner appointed to examine the bridge across the Sacramento River near Chico, has recommended that new piers be built at a cost of $6,000. An entire new structure similar in design is estimated to cost $9,100.

PEMBROKE, ONT.—A bridge at Mary St. is still under consideration by the Council. The engineer recommended a Howe truss bridge.

PETERBOROUGH, ONT.—Representatives of the Town and County Councils and the Dominion Government held a conference last week regarding the site for the proposed bridge across Chemong Lake at for the proposed bridge across Chemong Lake at Bridgenorth, toward which the Government has voted $10,000. J. D. Belcher, County Engineer, will report on the different sites.

PHILADELPHIA, PA.—The ordinances pending in the Council authorize the building of two bridges on Rhawn St. over Pennypack Creek; also for two bridges on Olney Ave., one under the Tabor branch of the Philadelphia & Reading, and one under the Penna. branch of the P. & R. Plans and specifications will not be prepared until the ordiances are passed.

The Select Council has passed a bill authorizing a bridge across Fifteenth St., connecting the buildings of the Baldwin Locomotive Works between Buttonwood and Spring Garden Sts.

POCOMOKE, MD.—The New York, Philadelphia & Norfolk Ry. will build a new steel drawbridge across the Pocomoke River. It will be about 160 ft. long and cost in the neighborhood of $75,000.

PORTLAND, ORE.—Oct. 14 the County Commissioners received 16 bids ranging from $29,665 for six fixed spans for the Madison St. bridge, to $80,000 for a structure with a swing span. (Oct. 6, p. 699.) The bids were on three designs.

RAT PORTAGE, ONT.—A bridge across the bay at Norman is being agitated. The Government will be asked to contribute toward the cost.

RED BLUFF, CAL.—The Paskanta bridge has been condemned and a new bridge ordered built, for which the contract has been left to the Pacific Bridge Co., for a steel bridge of two spans of 80 ft. each, on tubular piers, at a cost of $6,800.

ST. STEPHEN, N. B.—Tenders are asked for a bridge at Oak Bay.

SALINAS, CAL.—The Clerk of the Board of County Supervisors will receive bids Nov. 8 for building a bridge over the Cabilan Creek between Salinas and Natividada.

SAN RAFAEL, CAL.—County Surveyor Richardson will prepare plans and specifications for a new county bridge across the Novato Creek; also for repairing the bridge between Tiburon and Belvedere.

SOUTHAMPTON, N. Y.—The State Railroad Commissioners have ordered the crossing of the North Sea Road in Southampton, and the Butter Lane Highway at Bridgehampton, in the town of Southampton across the Long Island RR., abolished. The highways will run under the railroad tracks.

STRATFORD, ONT.—A bridge over the Adam River on John St. is in consideration by the Council.

TAUNTON, MASS.—The bids for the proposed bridge at Scadding St. were rejected on the 10th and the matter postponed until spring.

TOLEDO, O.—J. J. Barber is reported interested in a project to build a bridge across the Maumee River from Jefferson St.

TOPEKA, KAN.—The County Commissioners have made an appropriation of $2,000 for preliminary work on the bridge across the Kansas River between Shawnee and Jefferson counties, the total cost of which will probably be $10,000.

UNIONTOWN, PA.—Viewers have been appointed for a bridge across Nauvoo Creek in Washington Township.

WASHINGTON, D. C.—In his annual report Gen. Wilson, Chief of Engineers, U. S. A., recommends building the proposed Memorial bridge across the Potomac River to Arlington Cemetery, and a boulevard to connect the Capital with Mt. Vernon. It is anticipated that the engineers now preparing designs for the bridge will submit them by January 16, 1900, and that the matter will be brought to the attention of Congress by a special report during the month of February, 1900.

WELLAND, ONT.—The Canal Board is considering plans for a new bridge to be built across the Welland Canal near this place.

WILKESBARRE, PA.—The Board of Trade held a meeting last week to consider plans for the new bridge across the pond holes.

WINDHAM CONN.—The New York, New Haven & Hartford has let a contract to the Berlin Iron Bridge Co. for an iron bridge 164 ft. long, consisting of two plate girder spans of equal length across the Willimantic River. Lathrop & Shea, New Haven, Conn., will build the foundations. The total cost will be $18,000.

WINNIPEG, MAN.—The Canadian Pacific proposed to build a bridge over the tracks at Main St., which is estimated to cost $104,000, according to report. The bridge will run from Higgins Ave. to Sutherland Ave.

WORCESTER, MASS.—Plans for bridges on the main line of the Warren, Brookfield & Spencer Electric road are being made by Messrs. Thompson & Wheeler, of Worcester.

YEADON, PA.—A new bridge is proposed across Cobbs Creek at a probable cost of $3,000.

**Other Structures.**

ALBANY, N. Y.—Armour & Co., according to report, contemplate building a warehouse and cold storage plant in the North End.

ALLENTOWN, PA.—The Heilman Boiler Works will build an addition to their plant on Railroad St. between Linden and Hamilton.

ALTON, ILL.—The Board of Education are unanimous on a proposition to build a $40,000 high school.

Reports state that the Bluff line is considering a site for a new passenger station necessitated by the removal of tracks.

ATLANTA, GA.—Messrs. Bruce & Morgan are preparing plans for a 12-story (possibly 14-story) office building at Broad, Marietta and Walton Sts., Atlanta. It will be of steel skeleton. The architects will receive bids about Dec. 1.

ATTICA, IND.—Plans are being prepared by Samuel B. Colton of Chicago, Ill., for a new Casino building to be built at Attica in connection with a mineral springs.

BIRDSBORO, PA.—Reports state that a new shoe factory will be built at Birdsboro, Berks County.

BRIDGEPORT, CONN.—See Bridge Building.

BUFFALO, N. Y.—The Board of Aldermen are considering a new West Side school site at Baynes St. and Pacific Ave.

CHESTER, PA.—Plans are being prepared by Seymour Davis of Philadelphia, for a high-school building for Chester to cost about $100,000.

CHICAGO, ILL.—H. E. Bucklen has a permit to build a six-story warehouse to cost $22,000, at the rear of Nos. 279-80 Michigan Ave.

The Chicago Commons association will build a four- story school building at No. 169 North Morgan St., to cost $20,000.

The Chicago Consolidated Traction Co. is to build a car shop, covering 71 x 326 ft., at the northwest corner of Elston and Addison Aves. The cost will be about $15,000.

Work on rebuilding the horse market at the Union Stock Yards, which was burned Sept. 21, is well advanced. Grace & Hyde are the contractors. Four brick buildings, 60 ft. x 210 ft. long each, and two stories high, to accommodate 600 horses, are being built. In the center of the four buildings there will be an amphitheatre with galleries to seat 1,000 people, and a dome 60 ft. high. The dome will be of steel construction and work on it begins this week. (Oct. 6, p. 69.)

Deeds have been recorded conveying 600 ft. by 350 ft. of land at the Southwest corner of North Park and Belden Aves.; and 520 ft. by 184 ft. at the Northeast corner of North Clark St. and Webster Ave., to five trustees who are to act for the school for the training of teachers which Mrs. Emmons Blaine of Chicago will build. Mr. James Gamble Rogers is the Architect of the proposed buildings and he is at work on preliminary drawings of the first building to be built, but the design has not yet been accepted by the trustees.

ELMIRA, IA.—The Burlington, Cedar Rapids & Northern is replacing a wooden dam about one mile west of Elmira with one of concrete and stone. This dam was built between five and six years ago and forms a reservoir, with an area of about eight acres and varying in depth from 8 to 18 ft., from which the road takes its water supply.

FORT DODGE, IA.—At the November election it will be decided if $100,000 of bonds shall be issued for a new court house and jail for Webster County.

GREEN LAKE, WIS.—The Terrace Beach Casino was burned on Oct. 18. The total loss is placed at $50,000. W. A. Meyer, owner.

GUTHRIE, O. T.—The Atchison, Topeka & Santa Fe RR., according to report, is receiving proposals for a new station at this place.

HARRISBURG, PA.—It is reported that the Harrisburg Silk Mills contemplate enlarging its present plant by a brick and iron addition.

HAVANA, CUBA.—The old Military Hospital at the foot of Saurez St. in Havana is to be converted into a penitentiary. The Military Hospital is one of the largest structures in the city being 400 x 500 ft. and three stories high. The walls are of stone and 18 in. thick. The floors are also of stone. The cost of the new building is set at $400,000.

KOKOMO, IND.—A new opera house will be built in Kokomo at a cost of $35,000 by Geo. H. Johnson of St. Louis, Mo.

LOS ANGELES, CAL.—Bonds for $200,000 have been sold for a new school house in this city.

MILTON, PA.—The pattern building of the American Car & Foundry Co. at this place was totally destroyed by fire Sunday, Oct. 15.

MINNEAPOLIS, MINN.—The Pillsbury-Washburn Co. will build another flour mill in Minneapolis, according to report. This company now has a daily capacity of 28,000 barrels, and it is expected to increase it to 35,000 barrels.

MOUNT HOLLY, N. J.—Mr. Thomas Stevens, an architect of Camden, N. J., is working on drawings for a new insane asylum to be built near Mount Holly at a cost of about $25,000.

MUNCIE, IND.—The Big Four, according to report, will make improvements to the passenger station in Muncie. The freight depot will be removed and enlarged.

NEW YORK, N. Y.—A seven-story flat to cost about $170,000 will be built on Central Park West and 92d St. by J. V. Segnel, after the resigns prepared by Neville & Bagge.

Flemer & Koehler have filed plans with the Building Department for a six-story brick store and loft building, 50 x 198.6 ft., at Nos. 112 and 114 W. 42d St., with a frontage at No. 107 to 117 W. 41st St. west of Sixth Ave., for Alexander J. Halter, at an estimated cost of $300,000.

Plans were also filed for an eight-story and basement brick store and shop building, 97.6 x 48.5 ft., by Lazarus Levy, to be built on the southeast corner of East Broadway and Catharine St., to cost $75,000.

A seven-story flat to cost $125,000 will be built on the corner of West End Ave. and 79th St., by Arthur D. Hyde. Mr. C. Steinmetz is the architect.

The Commissioner of Estimate of the school site on 116th and 117th Sts. between Fifth and Lenox Aves., reports that they have secured a plot 150 x 201.1 ft. for the proposed building.

PHILADELPHIA, PA.—A new school house will be built on the corner of Frankford Ave. and Somerset St., at a cost of $85,000. It will be 124 x 60 ft.

Plans have been filed with the Building Department for a two-story building, 45 x 63 ft., on Tioga St., east of Richmond, for the United Gas Improvement Co. Wilson Bros. & Co. are the architects.

Messrs. Ryan & Kelley are receiving bids for a double-deck pier for the Baltimore & Ohio RR. at Snyder Ave.

Plans have been filed with the Department of Buildings by Messrs. Doyle & Doak for a new stable for the United Gas Improvement Co., at Eighth and Mifflin Sts.

The Philadelphia & Reading is about to build a freight shed, covered with corrugated iron, 150 x 634 ft., and along Delaware Ave.; 46 x 660 ft. at Pier C, above William St., Port Richmond. Also, one-story brick engine and dynamo building, 30 x 50 ft., at the coal storage yard at Clearfield St. Also, galvanized iron boiler house shed, 42.4 x 22.2 ft., at Clearfield St. The total cost will be about $70,000.

The Building Commissioners' estimate for 1900 is $22,000,000, of which $2,000,000 will be asked for immediate work.

PITTSBURGH, PA.—The S. Jarvis Adams Co. has made application for incorporation to make malleable iron castings and do general foundry work, for which a plant recently bought at Fourteenth and Aetna Sts., Pittsburgh, will be enlarged and used. Among the incorporators are Henry C. Fownes, Joseph McKnight Speer and Chas. McKnight.

PROGRESSO, MEX.—The Schultz Bridge & Iron Co. of Pittsburgh, Pa., has a contract for two steel warehouses to be built in Progresso, Yucatan, Mex., which will be used for storage of hemp. The sizes of these buildings are 40 x 80 meters and 40 x 100 meters.

ROCKVILLE CENTER, N. Y.—Reports state that the Long Island RR. will build a new station between Park and Morris Aves.

RUTHERFORD, N. J.—It has been voted to issue $42,000 of bonds for a new school house, and $1,500 bonds for furnishing the same.

ST. LOUIS, MO.—A building permit has been issued to the Scullin-Gallagher Steel Co. for a foundry, boiler and engine rooms. The buildings will be on the south side of Manchester Ave. near Kraft Ave. The total cost will be about $125,000. Thomas M. Gallagher is a member of the concern.

A ten-story fireproof hotel building will be built on the site of the St. James Hotel at Broadway and Walnut St. The new structure is estimated to cost $300,000. Mr. Walter H. Quynn is Secretary of the St. James Hotel Co.

The Board of Education has secured permits for building three additions to school houses. They are the Dozier school on Maple Ave. near Goodfellow, to cost $35,000. A two-story addition is also to be erected to the Mount Pleasant school on Nebraska Ave. near Neosho St., to cost $29,000. The third is for a one-story addition to the Marquette school on McPherson Ave. between Vandeventer Ave. and Sarah St., to cost $13,000.

SHARON, PA.—The plant of the Shelby Tube Works at Greenville, Mercer County, will be enlarged.

TAYLORVILLE, ILL.—The matter of building a new court house for Christiana County will be decided at the next election. The new court house is estimated to cost $100,000.

TYRONE, PA.—Reports state that Mr. Andrew Carnegie has given $50,000 to build a new free library building in this place.

TORONTO, ONT.—Reports state that a $1,000,000 hotel will be built in Toronto by the Canadian Pacific RR.

WARRENSBURG, N. Y.—I. S. Woodward, President of the Board of Education of this place, received proposals on the 26th for $20,000 bonds of Union Free School District No. 1 of this town for a new school house.

WEST POINT, N. Y.—Sealed proposals, in triplicate, will be received at West Point until 12 m., Oct. 27., for the construction of additio to Cadet Hospital. Address Q. M., U. S. M. A., West Point.

## MEETINGS AND ANNOUNCEMENTS.

**Dividends.**

Chicago, Rock Island & Pacific.—Quarterly, 1¼ per cent., payable Nov. 1.

Georgia Southern & Florida.—First preferred, 2½ per cent.; second preferred, 3 per cent., both payable Nov. 8.

Pacific Coast Co.—Quarterly, 1¼ per cent., five-twelfths of 1 per cent. additional upon the first preferred stock, a dividend of 1 per cent. and also an additional dividend of one-third of 1 per cent. on the second preferred stock, and dividend of 1 per cent. on the common stock, payable Nov. 1.

Pullman's Palace Car Co.—Quarterly, $2 per share, payable Nov. 15.

Syracuse, Geneva & Corning.—Quarterly, ⅞ per cent., payable Nov. 1.

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Albany Ry. (N. Y.).—Quarterly, 1½ per cent., payable Nov. 1.

Central Traction (Pittsburgh).—One and a half per cent., payable Oct. 31.

Chicago Union Traction.—Quarterly, 1¼ per cent., payable Nov. 20.

Duquesne Traction (Pittsburgh).—Two per cent., payable Oct. 31.

Exeter, Hampton & Amesbury.—Quarterly, 1¼ per cent., payable Nov. 1.

Pittsburgh Traction Co.—Three and a half per cent., payable Oct. 31.

United Rys., El. Lt. & P. (Balto.).—Preferred, 2½ per cent., payable Nov. 1.

Worcester & Marlborough.—Two and a half per cent., payable Nov. 15.

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**The North-West Railway Club.**

At the regular meeting of the North-West Railway Club, at the Ryan Hotel, St. Paul, Tuesday, Sept. 12, the papers presented were: "Some Notes on Rope Driving," by J. J. Flather, Professor of Mechanical Engineering in the University of Minnesota; also "The Study of Cast Steel in the Blacksmith Shop," by Mr. Geo. F. Hinkens.

**The Engineers' Club of Philadelphia.**

A regular meeting of the Club was held on Saturday, October 21, at 8 o'clock p. m. The paper of the evening was: "Philadelphia—what are its needs? Its Water-Supply, Rapid Transit, Parks and Buildings." Illustrated. The discussion was opened by Harry V. B. Osbourn.

The Secretary announced that the Information Committee has been requested by Prof. Wm. H. Burr for an indefinite postponement of his paper on "Long-Span Bridges."

**Engineers' Society of Western Pennsylvania.**

The one hundred and ninety-eighth regular monthly meeting of the Engineers' Society of Western Pennsylvania was held in the Lecture Room of the Society's house, 410 Penn Ave., Tuesday evening, Oct. 17. The principal business of the evening was the discussion of the report of the Smoke Committee. A number of valuable suggestions regarding the special points were made by the members. The report was finally referred back to the Committee for action on the suggestions. The report which has been published in several papers was not the authorized report of the Society, but was merely a preliminary report, published to enable the members to prepare themselves for the discussion.

**General Passenger Agents.**

The American Association of General Passenger Agents held its annual meeting at Boston, Oct. 17 and 18. The annual address was delivered by Mr. George T. Nicholson, Passenger Traffic Manager of the Atchison, Topeka & Santa Fe. The election of President for the ensuing year resulted in the choice of George H. Daniels, of the New York Central & Hudson River.

On the report of a special committee the convention considered revised forms of contracts on interline tickets, forms being submitted by the committee for one way tickets, one way ironclad and round trip ironclad tickets. No final action was taken, but there was considerable opposition to the clause, as suggested by the committee, requiring a passenger on a limited ticket to reach his destination before midnight of the last day, instead of simply requiring him to begin his journey on the last coupon before that hour. Among the conditions in the forms proposed are one reserving to each line the right to check baggage to final destination only, and one limiting the amount recoverable, where a conductor mistakenly refuses to honor a ticket, to the amount paid for the ticket. In the matter of safety paper for interline tickets, concerning which the Association has already gone on record as in favor of the abandonment of all tickets on old styles of paper by the first of next January, it was voted to extend the time one year. Members seem to be universally in favor of the rule to have all interline tickets on safety paper, but not uniformly enthusiastic in actually carrying out the rule on their respective roads.

Next year's meeting will be held at Buffalo.

**Western Railway Club.**

A meeting of the Western Railway Club was held Tuesday afternoon, Oct. 17, at the Auditorium Hotel, Chicago. As previously announced, Dr. A. R. Reynolds, Commissioner of Health, Chicago, presented a brief discussion of "The Smoke Nuisance," asking a series of questions regarding combustion designed to bring out discussion, and requested that a committee be appointed to report on the whole question of locomotive combustion, and what can be done to prevent smoke. This committee, as appointed, was made up as follows: Messrs. G. R. Henderson, Chicago & Northwestern; R. D. Smith, Chicago, Burlington & Quincy; J. C. McMynn, The Robert W. Hunt & Co.; Prof. R. A. Smart, Purdue University, and J. W. Luttrell, Illinois Central.

During the discussion Mr. F. A. Delano (Chicago, Burlington & Quincy) called attention to the fact that locomotive boilers were worked between five and ten times as hard as boilers in ordinary stationary practice, but that an important step in locomotive construction was now being taken, namely, the adoption of grates from 6 to 8 ft. wide, whereas 3 ft. 4 in. was now the usual width of grates. With wide grates the rate of combustion would be lower and less smoke should result with good firing. The Burlington has now building four switch engines with wide, deep fire boxes. The cost of coke had prevented its use on Western roads. Mr. Robert Quayle (Chicago & Northwestern) said that Illinois coal was not smokeless, and there were many varieties which gave very different results, so that the work of the fireman was of an uncertain nature. Heavy trains were often obliged to stop suddenly and unexpectedly within the city limits, and in such cases the trains could not be started without making smoke. Prof. R. A. Smart said the conditions under which the fire box of a locomotive was worked about terminals was subject to such rapid changes that it was impossible to prevent making some smoke; it was only where the conditions were constant that the best results could be expected. Mr. J. C. McMynn described experiments he had made for coking Illinois coals, and he thought it would not be long until a fair quality of coke could be obtained at a low price; if this coke should contain too much sulphur, a mixture of coke and coal might be used.

Mr. G. W. Rhodes, Chicago, Burlington & Quincy, next opened the discussion of the question of adopting a standard box car. The subject is one which has been considered by the American Railway Association, and it is thought that if action could be taken soon, some uniformity would be reached after six or eight years. The proposed inside dimensions for such a car are: Height, 8 ft.; width between linings, 8 ft. 6in., and length between linings, 34 ft.

The paper, "Piece Work in a Railroad Shop," by Mr. R. T. Shea, was presented, but the discussion was deferred until the next meeting, when Mr. J. C. McMynn will read a paper on "Specifications."

## PERSONAL.

*(For other personal mention see Elections and Appointments.)*

—Mr. H. S. Reily, Assistant Master of Machinery at Hanover, Pa., of the Western Maryland, died Oct. 20.

—Mr. W. H. Haskell, at one time President of the West Amesbury Branch RR., died Oct. 8. Mr. Haskell was born in Newburyport in 1810.

—Mr. William Geagen, who recently resigned as General Traffic Manager of the Merchants' Despatch Transportation Co., died at Yonkers, N. Y., Oct. 13.

—Mr. F. J. McLain has been elected Treasurer of the American Cotton Co., at Houston, Tex. Mr. McLain recently resigned as Auditor of the Arkansas Southern RR.

—Mr. J. F. Townsend has been appointed Traffic Manager of the National Tube Co., with headquarters at Pittsburgh, Pa. This is the new company which recently absorbed thirteen of the largest tube plants in the country.

—Mr. Albert Ladd Colby, Metallurgical Engineer of the Bethlehem Steel Co., So. Bethlehem, Pa., has resumed the duties of his position, after a year's sojourn in the Adirondack woods, which has completely restored his health.

—Mr. James F. Jackson, the new Chairman of the Massachusetts Board of Railroad Commissioners, was born in Taunton, Mass., in 1851. Mr. Jackson is a graduate of Harvard University. He is a lawyer of Fall River, and a member of the firm of Jackson, Slade & Borden.

—Mr. John T. Moody died at Bridgeport, Conn., on Oct. 12. Mr. Moody was born in England in 1814 and in 1870 was appointed Assistant Superintendent of the New York & New Haven, which road soon after became the New York Division of the New York, New Haven & Hartford. He was subsequently promoted to the Superintendency of the Division, which place he held until 1882.

—Mr. Spencer M. Janney, President of the Huntingdon & Broad Top Mountain, died suddenly on Oct. 20. Mr. Janney was born in Philadelphia, Pa., in 1840 and began his railroad career in 1882. He has served consecutively with this company since then as Director and Member of Road Committee, President pro tempore, and finally became President, which position he held at the time of his death.

—Mr. Thomas W. Welsh, until a few years ago Superintendent of the Westinghouse Air Brake Co., died at his home in Wilmerding, Pa., last week. Mr. Welsh at one time was employed in the Pennsylvania Railroad shops at Twenty-eighth St., Pittsburgh, and later became Foreman, which position he resigned to become Superintendent of the Westinghouse Air Brake Co. He continued as a director of the Westinghouse Co. until the time of his death.

—Mr. W. W. Wheatley, Assistant General Superintendent of the Brooklyn Rapid Transit Co., has been appointed Acting General Superintendent of all surface lines owned and controlled by this company, in place of Mr. Ira A. McCormack, General Superintendent, whose resignation was noted last week. From 1875 to 1896 Mr. Wheatley served in various capacities on the Chesapeake, Ohio & Southwestern (Illinois Central), Chicago & Northwestern and West Shore railroads, resigning in 1896 as Car Accountant of the last named road to become Division Superintendent of the Brooklyn Heights RR. Mr. Wheatley is also well known as Secretary of the New York Railroad Club.

—Mr. Horace S. Smith, former Vice-President of the Illinois Steel Co., died at his home in Chicago Oct. 17, after an illness of several months. Mr. Smith was born in New England in 1826, and as a young man went into railroad work. After the Civil War he went to Chicago and became connected with the Chicago & Alton. In 1875 he went to the Joliet Steel Co. and at once began the work of consolidating the Western steel companies, which was afterward successfully accomplished. When the Illinois Steel Co. was organized Mr. Smith was elected Vice-President, which position he held until his retirement from active business on account of failing health. He was a member of the Union League and Kenwood Clubs.

## ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—D. J. Sheehan has been appointed Deputy Comptroller.

Atlantic & North Carolina.—The officers of this company are: Secretary and Treasurer, M. Manly, succeeding D. M. Stanton, resigned; Auditor, S. I. Wooten, succeeding B. F. Scarborough, resigned, and Superintendent, S. L. Dill.

Bangor & Aroostook.—At the annual meeting of the stockholders held at Bangor, Me., Oct. 18, E. L. Cleveland, C. C. King and A. E. Hammond were elected Directors.

Cammal & Black Forest.—J. S. Childs has been elected Vice-President, with headquarters at Jersey Shore, Pa. C. B. McCullough, heretofore Assistant General Manager, has been appointed General Manager, with headquarters at Cammal, Pa., succeeding Mr. Childs.

Central Vermont.—We are officially informed that the statement in reference to the resignation of W. J. Robertson as Master Car Builder of the road is incorrect. Mr. Robertson is still in the service of the C. V.

Chatham & Lebanon Valley.—The officers of this company (successor to the Lebanon Springs) are: President, William C. Roberts; Vice-President, Walter W. Hastings; Secretary and Treasurer, C. F. Ainsworth; Counsel, John Delahunty, and Superintendent, H. McGonegal. (See RR. Construction column.)

Chicago, St. Paul, Minneapolis & Omaha.—William Bennett has been appointed Assistant Superintendent of the Sioux City & St. Paul Division, with headquarters at St. James, Minn., succeeding G. S. Strickland, just appointed Trainmaster.

Chicago, Burlington & Quincy.—W. A. Armory has been appointed Assistant Auditor and not Assistant General Auditor, as incorrectly stated by a contemporary on Oct. 6. F. S. Bagg has been appointed Auditor of Expenditures, succeeding Mr. Armory.

A. B. Pirie has been appointed Master Mechanic of the Havelock Shops, and F. J. Kraemer has been appointed Master Mechanic of the Southern Division of the Burlington & Missouri River in Nebraska (a part of the C., B. & Q.), with headquarters at Wymore, Neb., effective Oct. 24.

Cincinnati, New Orleans & Texas Pacific.—At a meeting of the stockholders, held on Oct. 16, Henry F. Shoemaker was elected Chairman of the Board and Samuel Spencer, President, succeeding Samuel M. Felton.

Cleveland, Lorain & Wheeling.—H. R. McMahon has been elected Secretary, succeeding W. A. Shoemaker, resigned, and W. S. Wade has been elected Treasurer, succeeding H. T. Sandford, resigned, effective Oct. 23.

Eastern Ry. of Minnesota.—D. McNab has been appointed Assistant Superintendent, with headquarters at Superior, Wis., succeeding G. T. Ross.

Evansville & Terre Haute.—At a meeting of the stockholders, S. Parsons, E. O. Hopkins and H. Duryea were elected Directors.

Fitchburg.—W. L. Stevenson heretofore General Superintendent of the Kansas City Suburban Belt, has been appointed Trainmaster of the Fitchburg and Tunnel Divisions, succeeding G. B. Gowen, transferred.

Florida Central & Peninsular.—John Skelton Williams, President of the Seaboard Air Line, has been elected President of the F. C. & P., with headquarters at Richmond, Va., succeeding H. R. Duval, resigned.

Great Northern.—J. M. Davis has been appointed Superintendent of the Breckenridge Division, with headquarters at Breckenridge, Minn., succeeding Mr. Tyler. W. T. Tyler has been appointed Superintendent of the Montana Division, with headquarters at Havre, Mont., succeeding Mr. Davis. W. N. Neff has been appointed Assistant Superintendent of the Kalispell Division, with headquarters at Kalispell, Mont. B. F. Egan has been appointed Assistant Superintendent of the Northern Division, with headquarters at Grand Forks, N. D., succeeding Mr. Neff. H. E. Byram has been appointed Superintendent of the Cascade Division, with headquarters at Everett, Wash., succeeding R. H. Bowron, resigned. G. T. Ross has been appointed Assistant General Superintendent of Montana Central Ry., with headquarters at Great Falls, Mont., succeeding Mr. Byram, transferred.

Gulf & Ship Island.—C. I. Millard has been appointed General Traffic Manager, with headquarters at St. Louis, Mo., and Thos. P. Hale has been appointed General Freight and Passenger Agent, with headquarters at Gulfport, Miss.

Jacksonville & Southwestern.—Smith D. Pickett has been appointed General Freight and Passenger Agent of this company, which is now building. (RR. Construction column, Oct. 20, p. 737.)

Kansas City & Northern Connecting.—W. G. Brimson, General Manager of the Omaha, Kansas City & Eastern, has been appointed General Manager of the K. C. & N. C., with headquarters at Quincy, Ill., succeeding E. H. Shaufler, resigned, effective Oct. 20.

Kansas City, Pittsburgh & Gulf.—W. E. Green, heretofore General Superintendent, has been appointed Superintendent of the Southern Division, which includes the line from Mena South, with all branches, with headquarters at Texarkana, Tex., and the office of General Superintendent is abolished.

Kansas City Suburban Belt.—W. L. Stevenson, General Superintendent, with headquarters at Kansas City, Mo., has resigned.

Louisiana Eastern.—The officers of this company, including those mentioned under Elections and Appointments, p. 718, are: H. D. Bickham, Treasurer, of Franklinton, La., and J. M. Yates, Chief Engineer, of Covington, La. (See RR. Construction column.)

Louisville & Nashville.—A. W. Morriss is Assistant Treasurer and Assistant Secretary of the L. & N., with headquarters at New York.

Maine Central.—Lucius Tuttle, President of the Boston & Maine, has been elected President of the M. C., succeeding F. A. Wilson.

Merchants' Despatch Transportation Co.—H. B. Tindall has been appointed Traffic Manager, with headquarters at New York City, succeeding William Geagan, deceased.

Michigan Air Line.—At the annual meeting of the stockholders held at Detroit, Mich., Oct. 2, Chas. M. Hays was elected President, succeeding H. B. Ledyard, and Chas. Percy was elected Secretary and Treasurer, succeeding A. J. Burt. The following Directors were also elected: Chas. M. Hays, W. J. Spicer, J. H. Muir, E. W. Middaugh and J. Bell.

Missouri Pacific.—J. J. Ball has been apointed Trainmaster, succeeding M. A. Lally, transferred.

Muskegon, Grand Rapids & Indiana.—At a meeting of the stockholders held Oct. 16, W. R. Shelby was elected President and W. B. Stimpson Director, succeeding W. O. Hugart, deceased.

Norfolk, Virginia Beach & Southern.—Morris K. King has been appointed General Manager, with headquarters at Norfolk, Va., succeeding B. P. Holland.

Pennsylvania Co.—J. F. Patterson has been appointed Trainmaster of the Western Division, succeeding C. E. Walton, resigned.

Philadelphia & Reading.—The office of Supervisor at Tamaqua, Pa., has been abolished.

Pittsburgh Junction.—Henry Chalfant has been elected a Director, succeeding John W. Chalfant, deceased.

Pullman's Palace Car Co.—Robert T. Lincoln, heretofore Chairman of the Executive Committee, was on Oct. 20 elected President.

St. Louis Southwestern.—R. H. Bowron has been appointed Superintendent of the Arkansas and Missouri Division, with headquarters at Pine Bluff, Ark., succeeding F. S. Rawlins, resigned, effective Oct. 15.

Southern.—The jurisdiction of Master Mechanic J. T. Robinson has been extended to cover the entire Anniston Division. The office of Master Mechanic at Mobile, Ala., is abolished, T. E. Harwell being appointed General Foreman at Mobile.

Texarkana, Shreveport & Natchez.—J. J. Kress has been appointed General Superintendent of this

company, which is now building, with headquarters at Texarkana, Ark. (See RR. Construction column, Sept. 1, p. 620.)

Vera Cruz & Pacific.—Charles G. Wood has been appointed Treasurer, with headquarters at Orizaba, Mexico.

Wheeling & Lake Erie.—J. F. Townsend, General Freight and Passenger Agent, with headquarters at Cleveland, O., has resigned.

Wrightsville & Tennille.—At a meeting of the stockholders, A. F. Daly was elected President and General Manager and T. T. Holloman was appointed Superintendent.

## RAILROAD CONSTRUCTION.
### New Incorporations, Surveys, Etc.

ATCHISON, TOPEKA & SANTA FE.—An officer writes that the company has been engaged for the past year in reducing its grades between Temple, Tex., and Sealey, and the work is now nearly completed. (Sept. 29, p. 685.)

ATLANTA BELT.—The Atlanta & West Point, which was compelled by a Supreme Court decision to give up its project of building a belt line around Atlanta, Ga., has disposed of its right of way to the Atlanta Belt. The line is to be 5½ miles long, extending from Oakland to a point near where the Georgia enters the city. George C. Smith of Atlanta, Ga., is made President of the new company. (A. & W. P., Aug. 4, p. 560.)

BANGOR & AROOSTOOK.—Work is to be pushed vigorously in the spring on the Patten, Allegash & Northern extension of the Patten & Sherman, from Patten, Me., north about seven miles to the Seven Islands in the County of Aroostook. About 100 men are filling in a deep ravine near Patten. Robert H. Burleigh of Houlton, Me., is President. (P., A. & N., March 3, p. 161.)

The extension from Caribou, Me., north 33 miles to Van Buren, is practically completed, and freight trains will be running in a few days. (Oct. 20, p. 736.)

BELLEFONTE CENTRAL.—An officer writes that the company has just laid 1½ miles of track to Scotia, Pa., from Graysdale. The work was done by the company's forces. There will be no passenger trains run at present. (Oct. 13, p. 718.)

In June last the company also relaid three-fourths of a mile of track to the Mattern ore bank, taken up about four years ago. (July 28, p. 547.)

BRITISH COLUMBIA ROADS.—Ernest Miller of Ottawa, Ont., on behalf of Lloyd A. Manly and others, gave notice Oct. 14 of application to incorporate a railroad from a point on the International line near Cascade, B. C., to run west along the valley of the Kettle River to Carson, with a branch from near Grand Forks to a point 50 miles up the north fork of the Kettle River.

Frank Higgins of Victoria, B. C., on Oct. 12 gave notice of application to the Canadian Parliament for a railroad from Victoria to run northwest to Hardy Bay, at the northern end of Vancouver Island.

BURLINGTON, CEDAR RAPIDS & NORTHERN.—The extension of the Downes-Armstrong branch from Armstrong, Ia., west 18 miles to Estherville on the main line, was completed Oct. 19. It is understood that the line is to be open for traffic at once. (July 28, p. 547.)

CANADIAN PACIFIC.—Track laying is reported completed as far as Greenwood, B. C., several miles beyond Eholt Pass. The entire line to Midway, 105 miles, is to be finished this season. (Sept. 29, p. 685.)

CHATHAM & LEBANON VALLEY.—An officer writes that the company is rebuilding its line, which is successor to the Lebanon Springs. No contracts are to be let. (Oct. 6, p. 701.)

CHESAPEAKE & OHIO.—The stockholders on Oct. 22 voted unanimously to build the Greenbrier extension up Greenbrier River to White Sulphur Springs. (Sept. 22, p. 667.)

Surveys are reported completed for an extension from Whitehouse, Ky., terminus of the Big Sandy branch, to run south about 25 miles to Prestonburg.

CHICAGO, BURLINGTON & QUINCY.—Bids are asked for building an extension from Toluka, Mont., on the main line, to run southwest about 110 miles to Cody, Mont., and thence to the eastern border of Yellowstone Park.

CHICAGO, MILWAUKEE & ST. PAUL.—A force of 100 men is at work in the vicinity of Springville, Ia., straightening the track and improving the roadbed of the branch line from Paralta, Pa., via Animosa to Monticello.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—The Board of Trustees of the Cincinnati Southern, leased by this company and owned by the city of Cincinnati, have served notice on the Board of City Affairs of Cincinnati that they intend to use bonds to the amount of $2,500,000 for providing suitable terminals and for making permanent improvements on the system.

CRYSTAL RIVER.—Track is reported laid about four miles beyond Redstone, Col., on this line, from Carbondale, via Redstone to Marble, 30 miles. (Jan. 5, p. 15.)

DAVENPORT, CLINTON & EASTERN.—Rail laying was begun Oct. 11 on this line from Davenport, Ia., northeast 35 miles, via LaClaire, Princeton and Comanche, to Clinton, Ia. H. B. Schuler of Davenport, Ia., is President and C. E. Dearborn, Chief Engineer. (Sept. 29, p. 685.)

ERIE.—The company is reported surveying for a switch from Alfred Station, N. Y., into Alfred.

ESQUIMALT & NANAIMO.—This company has filed notice of application to extend its line to Cape Scott at the northern head of Vancouver Island. The line now runs from Vancouver northwest to Wellington, 78 miles, and is building on to Comox.

GEORGIA PINE.—Arrangements are reported in progress for an extension of this line from Bainbridge, Ga., southeast about 40 miles to Tallahassee, Fla.

GEORGIA ROADS.—J. H. Holland of Madison, Ga., writes that he owns the right of way for his proposed railroad from Madison, Ga., southeast 120 miles, via Milledgeville and Irwinton to Dublin, at which point the road would reach the navigable waters of the Oconee River whereby freight could be transported to Brunswick. Only one iron bridge will be required and three or four smaller bridges. The grading will be light.

GREAT NORTHERN.—Foley Bros. & Larsen of St. Paul, Minn., have the contract for the Spokane Falls & Northern cut-off from a point near Dragoon, Wash., to run southeast about three miles to the G. N. main line. (Oct. 20, p. 737.)

John F. Stevens, Chief Engineer, has been at Spokane, Wash., making arrangements for beginning work on the extension through that city. It is proposed to build a double track line, avoiding grade crossings, and the company expects to have a large force grading within 30 days. (Sept. 29, p. 685.)

Surveys are reported in progress for a branch from New Paynesville, Minn., to run north about 20 miles to Melrose.

IOWA CENTRAL.—Track laying is completed on the extension from Belmond, Ia., northwest 28 miles to Algona. Forces are at work on the side tracks at Algona. Ballasting is completed as far as Corwith. (Aug. 25, p. 603.)

JACKSONVILLE & SOUTHWESTERN.—The company has completed the line to Lake Butler, 54 miles, and is building from Lake Butler to Worthington Springs, nine miles. Of this extension, five miles is graded. (Oct. 20, p. 737.) The road as projected is from Jacksonville, Fla., south 89 miles, via Baldwin, Lake Butler and Worthington Springs to Newberry. (Official.)

KANSAS & TEXAS GULF.—The company has completed its entire line from Excello, Mo., via Ardmore to Brevier, about 14 miles. (Official.)

KINGSTON BRIDGE & RAILWAY.—A proposition has been submitted by the company to the Aldermen of Kingston, Tenn., to build a railway from that city, to run northwest to Emory Gap, connecting with the Harriman & Northwestern.

KNOXVILLE & BRISTOL.—Grading was begun last week on the extension from Blaine, Tenn., northeast 18 miles to Knoxville. It is stated that the extension southward is to be under contract soon. (Sept. 29, p. 685.)

KOOTENAY RAILWAY & NAVIGATION.—Track is reported laid on the Bedlington & Nelson line from Bonner's Ferry, Ida., north to Porthill, on the British Columbia boundary line. It is to be extended to Kootenay Lake, B. C., in all 52 miles.

LOUISIANA EASTERN.—Preliminary surveys are being made for this line from Covington, La., to run north about 25 miles to Franklinton. The road will not be difficult as it runs through a level country. There will be one bridge of about 600 ft. (Oct. 13, p. 719.) W. W. Babington of Franklinton, La., is President. (Official.)

LOWELL & HASTINGS.—Track is laid on the Grand Rapids, Belding & Saginaw line from Lowell, Mich., north six miles to Fernald. The company will build to Belding, in all 17½ miles. (May 5, p. 323.) W. A. Smith & Co. of Grand Rapids, Mich., have the contract. (Official.)

McCLOUD RIVER.—The company has built temporary spurs in several directions this season, and has graded 13 miles of track to Ash Creek in the direction of Altruras, on which rails will be laid next spring. (Oct. 13, p. 719.) The road will gradually be extended in the direction of Altruras. (Official.)

MENOMINEE & ST. PAUL.—About two miles of terminal track is laid in the city of Menominee, Mich. No more track is to be laid during the present season. (Sept. 29, p. 685.) H. W. Ashley, General Manager of the Ann Arbor, is General Manager. (Official.)

MEXICAN CENTRAL.—A. A. Robinson, President, is reported as saying that all the surplus earnings are to be devoted hereafter to the improvement of the present line and in building additional mileage.

MISSISSIPPI RIVER, COLESBURG & MANCHESTER.—The company has filed a mortgage for building this proposed line from Colesburg, Ia., southeast about 16 miles, via Petersburg and New Vienna, to Dyersville, connecting with the Chicago Great Western. W. C. Kirchheck of Colesburg is Secretary. (June 30, p. 483.)

MORENCI & SOUTHERN.—The route of this proposed company is from Morenci, Ariz., south 20 miles to Guthrie, on the Arizona & New Mexico. It may be continued on southwest to Solomonville, on the Gila Valley, Globe & Northern. The company was incorporated recently by members of Phelps, Dodge & Co., New York, which owns the Copper Queen mine at Bisbee, and the Detroit mine at Morenci. (Oct. 13, p. 719.)

MORGANTOWN & KINGWOOD.—Grading is completed to Shafers, 10 miles, and three miles of track is laid on this line from Morgantown, W. Va., through Dellslow, Masontown and Reedsville to Kingwood, 26 miles. The section to Masontown, 13 miles, is under contract. There are 200 men and 20 teams at work. There will be no further letting of contracts until next spring. (June 16, p. 439.) George C. Sturgiss of Morgantown is President. (Official.)

MT. AIRY & EASTERN.—The company has the grading completed from Mt. Airy, N. C., to Kibbler, Va., 22 miles, and track is laid for two miles out from Mt. Airy. The section is under contract to Mobley & Neeley of Mt. Airy. The work on the bridges is nearing completion. (Sept. 8, p. 633.) T. E. Houston of Elkhorn, W. Va., is President. (Official.)

MT. PLEASANT SOUTHERN.—The route proposed by this company is from a point on the Nashville, Florence & Sheffield, between Ridley and Attilla, to run southeast about five miles to Southport, all in Maury County, Tenn. The company was incorporated Sept. 15, with a capital stock of $40,000. The incorporators are: Herman D. Ruhm, John Ruhm, Jr., George F. Blackie, Ed. L. Gregory and J. G. Ingram, all of Mt. Pleasant, Maury County, Tenn. (Sept. 29, p. 685.)

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Locating surveys have been made, according to report, for six miles on an extension from Bon Air, Tenn., east toward Crossville. It is thought that the line will be extended to Crossville, and thence to Knoxville.

NEW YORK, NEW HAVEN & HARTFORD.—An officer writes that the company has no knowledge of contemplated improvements at Webster, Mass. (Oct. 13, p. 719.)

NORTH CAROLINA ROADS.—The line building by the Cleveland Cotton Mills Corporation of Laundale, N. C., south about 10 miles to Shelby on the South Carolina & Georgia, is to be completed about Nov. 1. Grading is nearly done and rails are laid for several miles. J. R. Oates of Shelby has the contract. (June 30, p. 483.)

NORTHERN PACIFIC.—Grading is reported begun on a spur from Wallace, Idaho, to coal mines, about 3½ miles. (Aug. 18, p. 589.)

PENNSYLVANIA.—Track laying is reported in progress on the Whippoorwill branch of the Pittsburgh, Virginia & Charleston, the line tapping an extensive coal field. (July 14, p. 515.)

With reference to the report that the Allegheny Valley would build an extension from Sligo, Pa., north about 10 miles to Clarion, an officer of the A. V. writes that a number of citizens of that town are anxious to secure a connection with the company but the route is difficult and there is not much business in sight. Unless the project is backed up by local capital to a considerably greater extent than has yet been shown, the prospect of building the branch is not an immediate one.

An officer writes that the company does not intend to build a line to the Buttonwood (Pa.) colliery, as reported. (Oct. 20, p. 737.) A transfer yard will be built in the near future in connection with the Central RR. of New Jersey, though this is comparatively a small matter, involving only three or four sidings.

PICKENS & HACKERS VALLEY.—This company has begun building this line in West Virginia, from Pickens, W. Va., on the West Virginia & Pittsburgh, to run west about 15 miles to Hackers Valley. (Sept. 29, p. 685.) Henry Spies of Pickens, W. Va., is interested. (Official.)

PITTSBURGH, BESSEMER & LAKE ERIE.—Orders have been issued, according to report, to begin double tracking this line at the southern end.

PITTSBURGH, JOHNSTOWN, EBENSBURG & EASTERN.—Grading is reported begun on the extension from Juniata, Pa., into Altoona. A large part of the line through Altoona will be elevated on trestle. (Sept. 15, p. 650.)

PITTSBURGH, WESTMORELAND & SOMERSET.—The first section of this line from Ligonier, Pa., to Mechanicsburg, seven miles, was thrown open for traffic last week. The road as projected is from Ligonier, on the Ligonier Valley, to run southwest to Laurel Mt. It is being built for the Byers-Allen Lumber Co. (Sept. 22, p. 668.)

RICHMOND & TIDEWATER.—Surveys are to be made, according to report, for this line from Richmond, Va., east about 60 miles to tidewater in Gloucester and Mathews counties.

RIO GRANDE WESTERN.—The company is to build a branch line from Revere, Utah, to Lamson to tap a tunnel which has been driven to reach copper and silver mines.

SACRAMENTO & SAN JOAQUIN VALLEY.—This company was incorporated in California Oct. 17, with a capital stock of $500,000, to build a railroad from Sacramento south about 65 miles to Stockton. Among the directors are: John Cross, Arthur G. Newton, A. P. Cross and J. S. Hanford. This may be the line referred to under California Roads (Sept. 1, p. 619), for which surveys are being made by Harry T. Compton.

SAN FRANCISCO & SAN JOAQUIN VALLEY.—An officer writes that the spur at Lucerne Vineyard, near Hanford, Cal., is about 3,000 ft. long and is intended to tap an industry located at the vineyard. (Sept. 29, p. 686.)

SANTA FE & GRAND CANYON.—Orders have been issued for track laying on this line from Williams, Ariz., on the Santa Fe Pacific, to run north 72 miles, via Flagstaff to the Grand Canyon of the Colorado. Over 30 miles of track is graded. (Oct. 6, p. 702.)

SEABOARD AIR LINE.—A branch is reported under contemplation from Pittsboro, N. C., to run northwest about 40 miles to Greensboro.

SIERRA OF CALIFORNIA.—Track is reported laid to within a half mile of Carters, on the extension from Sonora, Cal., via Summerville and Carters westward. Grading is in progress between Carters and Hussey's, 13 miles, and about eight miles of this section is completed. (Sept. 1, p. 620.)

SOUTHERN.—Track is laid from Cayce, S. C., to Perry, five miles, on the extension from Cayce south 32 miles to the Carolina Midland. Grading is completed to the Edisto River with the exception of a cut through Sand Mt., just beyond Perry. There is to be a long trestle over the Edisto River. The contract calls for the completion of the entire line by Nov. 15. (Sept. 22, p. 668.)

Surveys are reported in progress for a branch from Parrish, Ala., to a point on Loss Creek, 12 miles, through coal lands.

The people of Cabarus and Rowan counties, N. C., have made a proposition to the Southern to give right of way and grade for a branch line from Gold Hill south about nine miles to Mt. Pleasant.

SOUTHERN INDIANA.—Grading has reached a point within seven miles of Terre Haute, on the extension from Elnora, Ind., northwest 46 miles to Terre Haute. The track is laid to Linton. (Sept. 22, p. 668.)

UNION CENTRAL.—The route of this proposed line is from Waco, Tex., east about 100 miles to Palestine, with another intersecting line from Houston north about 300 miles to Paris. Bonds are sold for building the road, and the company will do its own work. Cyrus Baldridge of Kansas City, Mo., is President. James S. Bell, of 35 Nassau St., is the Eastern representative. (Official.)

VICTORIA, PORT ANGELES & EASTERN TERMINAL.—The Council of the city of Victoria, B. C., at its meeting held Oct. 10, authorized a subsidy of

$8,750 for 20 years to this company for a ferry and railroad connecting with the main line, the steamer to be built subject to the approval of the Council, the ferry and terminals to cost not less than $370,000. This will ultimately result in the extension of the Esquimalt & Nanaimo northward to the end of the island.

WAYCROSS AIR LINE.—Work is to be begun soon, according to report, on an extension of this line from Douglas, Ga., northwest about 45 miles, to Fitzgerald.

WHEELING AND LAKE ERIE.—No contracts have been let for cutting down the grades between Massillon, O., and Toledo. (Oct. 20, p. 738.) It is the intention to reduce the maximum grade against west bound business between Summit and Huron to 0.4 per cent., and against east bound traffic over the same territory to 0.6 per cent. (Official.)

WHITE PASS & YUKON.—Grading is reported completed for 15 miles on the extension from Bennett north 98 miles to White Horse Rapids. The road is to be ultimately extended to Fort Selkirk, about 240 miles from Skaguay, Alaska.

## GENERAL RAILROAD NEWS.

CANADIAN PACIFIC.—Land grant 5 per cent. bonds of 1881 to the value of $250,000 are drawn for redemption at 110 and interest, at the office of the Treasurer of the company at Montreal, Que., interest to cease Dec. 11. (Sept. 29, p. 686.)

CENTRAL VERMONT.—The American Loan & Trust Co. gives notice that the new securities under the plan of reorganizations are ready for delivery after Oct. 20.

COLUMBUS & NORTHWESTERN.—This portion of the Detroit & Lima Northern, extending south from St. Johns, O., is reported sold to Chas. N. Haskell, President of the D. & L. N. The parent company went into the hands of the receiver Sept. 12, 1898. (Sept. 16, 1898, p. 680.)

DELAWARE RIVER.—Press reports from New Jersey state that this company's property has been sold to the Pennsylvania RR. It runs from Woodbury, N. J., to Penn's Grove, 19.97 miles.

DENVER & SOUTHWESTERN.—Under the above title, a consolidation will be made with the Florence & Cripple Creek, the Midland Terminal, the Canyon City & Cripple Creek, the Metallic Extraction, the La Bella Mill, Water & Power, and the Colorado Trading & Transfer companies. A Boston prospectus states that the combined properties will include 127 miles of railroad, $3,125,000 of stock and $1,752,000 of bonds. The net earnings last year were $837,833. Against these earnings there will be an annual interest charge of $275,000, $95,000 for sinking fund and $100,000 for dividends on the preferred stock, leaving about $360,000 for dividends on the common stock. It is proposed to issue a general mortgage for $5,500,000, of which $570,000 will be reserved to redeem the Midland Terminal 5's outstanding. There will be $2,000,000 of 5 per cent. preferred stock, and $3,000,000 common stock. (F. & C. C., Oct. 20, p. 738.)

FARMVILLE & POWHATAN.—Applications were filed in the Law and Equity Court at Richmond, Va., Oct. 23, on the part of the bondholders, for the appointment of a receiver for this line, which runs from Bermuda to Farmville, Va., 88.72 miles, and from Coalboro to Winterpock, 3.14 miles. The capital stock is $500,000 and the funded debt $820,000.

FLINT & PERE MARQUETTE.—The company is tearing up about 10 miles of logging track from Midland, Mich., to Hubbard.

KANSAS CITY, ELDORADO & SOUTHERN.—The Missouri, Kansas & Texas, according to report, has bought this line for $225,000. It runs from Walker, Mo., on the M. K. T., to West Eldorado, 13 miles.

LAWRENCEVILLE & EMPORIA.—This property was sold at public auction Oct. 14, to W. E. Winner, of Kansas City, Mo., for $51,000. The line was abandoned March 22, 1894. It runs from Lawrence, Kan., to Carbondale, 31 miles, and was formerly part of the Union Pacific. (June 2, p. 394.)

LEAVENWORTH, TOPEKA & SOUTHWESTERN.—Officers of the Atchison, Topeka & Santa Fe have publicly announced the taking of this property by their company. (Oct. 20, p. 738.)

LEHIGH VALLEY.—The company has given notice of its intention to apply to the New Jersey Legislature for permission to abandon the Morris Canal as a waterway and to use its bed for other purposes.

LICKING VALLEY.—A Kentucky press report states that this property, running from Yale, Ky., south about 12 miles to Salt Lick, has been sold to Geo. C. Webb of Lexington, representing H. A. Fisk of Providence, R. I., for $31,000.

NASHVILLE & DECATUR.—The directors, at a meeting held in Nashville, Tenn., Oct. 18, voted to ratify the lease of this property for 999 years to the Louisville & Nashville. (L. & N., Oct. 13, p. 720.)

NEW ORLEANS & WESTERN.—The reorganization committee gives notice that more than 87 per cent. of the first Terminal mortgage bonds, and more than a majority of the second Terminal mortgage bonds have been deposited under the agreement of Aug. 1, and the agreement is declared operative. Other securities may be deposited up to noon, Nov. 4, under the present terms. (Sept. 1, p. 620.)

NEW YORK CENTRAL & HUDSON RIVER.—At a meeting of the directors on Oct. 23, it was voted to increase the capital stock of the company by $15,000,000. The proceeds are to be used for new rolling stock. The new capital stock is to be offered to stockholders pro rata at par.

The earnings for the quarter ending Sept. 30 on 2,828.04 miles of railroad were $14,184,398. The operating expenses were $8,471,578, making the net earnings for the quarter $5,712,820, or 59.72 per cent. of the gross earnings, against 61.57 per cent. the year before. After taking out the first charges and the sinking fund, the balance available for dividends for the quarter is equivalent to 2.56 per cent., or at the rate of more than 10 per cent. per annum.

NORFOLK & SOUTHERN.—Control has been obtained for this property, according to report, by the Norfolk, Virginia Beach & Southern. It runs from Berkeley, Va., to Edenton, N. C., 73.05 miles, and from Mackey's Ferry, N. C., to Belhaven, 29.8 miles. The capital stock is $2,000,000, and the funded debt $750,000.

NORTH PACIFIC COAST.—Twenty-five first mortgage bonds have been drawn for redemption Nov. 1, and interest will cease from that date.

PITTSBURG & WESTERN.—John Harson Rhoades, A. Foster Higgins and Chas. W. Baker, representing over 84,000 shares of stock, filed a bill in the Common Pleas Court at Pittsburgh, Pa., Oct. 17, against this company and the Baltimore & Ohio. They state that a meeting of the stockholders of the P. & W. is to be held, and that the B. & O. will vote over 130,000 shares of common stock. This they allege cannot be done legally, since the lines of the P. & W. parallel those of the B. & O., and the ownership of its stock by the latter is void under the Constitution of the State of Pennsylvania. The Court is asked to decree against such ownership, that a judicial sale of the stock is made and the B. & O. be restrained from voting for stock. A petition has been filed asking for the transfer of the case to the U. S. Circuit Court. (Oct. 20, p. 738.)

SEABOARD AIR LINE.—John Skelton Williams, President of this company, is quoted in Southern papers as follows with reference to the consolidation plans of his company:

Negotiations have been concluded with the Richmond, Fredericksburg & Potomac RR. from Richmond to Quantico, and with the Pennsylvania RR., extending from Quantico to New York, by which the trains of the Seaboard Air Line will enjoy the same rights between Richmond and Washington as those enjoyed by the Atlantic Coast Line. From Washington to New York the Seaboard Air Line will be upon precisely the same footing in the use of the tracks of the Pennsylvania RR. as either the Atlantic Coast Line, the Southern Railway or the Chesapeake & Ohio Railway. The link uniting the system and making a through line will be completed by Jan. 1. The distance from New York to Tampa by the new route will be 75 to 100 miles shorter than existing lines. The fiscal year which has just closed has been the most successful in the history of the Seaboard & Roanoke, the parent company of the system. The several roads which will take part in the consolidation have also made a magnificent showing for the past year. The aggregate surplus, after the payment of interest on bonds, has amounted during the past year to nearly 100 per cent. over fixed charges. That these roads should make so magnificent a showing, while operated separately and before they have begun to reap any of the advantages of increased business and of the economies in operation which will necessarily result from the consolidation, certainly promises well for the future. (March 10, p. 182.)

SEATTLE & SAN FRANCISCO.—A Seattle dispatch states that this company has bought the property of the Seattle Terminal Ry. & Elevator Co., at West Seattle, Wash. The property consists of a railroad connecting with the Northern Pacific, crossing the bay over a trestle nearly three miles long, to West Seattle, and extending along the west side water-front for a little over a mile, to a large elevator with a capacity of 50,000 tons.

WAGNER PALACE CAR.—Formal announcement is made of the absorption of this company into the Pullman's Palace Car Co. in the following circular from the headquarters of the Pullman Co.:

It is announced that negotiations have been concluded between the Boards of Directors of the Pullman and Wagner companies, subject to the ratification of their respective stockholders, by which the Pullman Company will purchase all the assets and property of the Wagner Company, including its contracts with railway companies, paying therefor 200,000 shares of Pullman stock—the capital stock of the Pullman Company to be increased accordingly for that purpose.

It is understood that the Board of Directors of the Pullman Company is to be increased, and that William K. Vanderbilt, J. Pierpont Morgan, Frederick W. Vanderbilt and Dr. W. Seward Webb will become members of the Pullman Board.

Steps are to be taken immediately to submit the matter to the stockholders for action and approval, and for that purpose a special meeting of the stockholders of the Pullman Company has been called for Dec. 5 next.

At an adjourned meeting of the Board of Directors of the Pullman Company, held to-day, a quarterly dividend of $2 per share was declared, payable Nov. 15, to stockholders of record Nov. 1.

The capital stock of the Pullman Co. is to be increased from $54,000,000 to $74,000,000, and is to be exchanged share for share. The report that this absorption carries several thousand shares of stock of the Boston & Maine, owned by the Pullman Co., to the Vanderbilts is denied by Lucius Tuttle, President of the B. & M. He says that the Pullman holdings of the B. & M. at the time of Mr. Pullman's death were 5,000 shares, all of which have been sold since that time. The consolidated company has cars operating on about 138,000 miles of railroad in the United States, Canada and Mexico.

WISCONSIN CENTRAL.—Proposals will be received until Nov. 1 for retiring $30,000 of first mortgage consolidated bonds of 1879. (Sept. 15, p. 650.)

ZANESVILLE & OHIO RIVER.—The committee of bondholders, of which H. B. Hollins is Chairman, gives notice that over two-thirds of the bonds have been deposited under the plan of reorganization and the plans declared operative. Other bonds may be deposited without penalty until Nov. 15. The line runs from Zanesville, O., to West Marietta, 72.04 miles. It went into the hands of a receiver July 19, 1892.

## TRAFFIC.

### Traffic Notes.

San Francisco papers report that between 300 and 400 business houses, representing seven cities, have joined the organization to oppose the reduction of L. C. L. freight rates from the East to the Pacific Coast.

The Hoosac Tunnel route (Fitchburg Railroad) refuses to sell second-class California tourist tickets reading over the Chicago & Northwestern, the Rock Island or the Burlington, because, as it alleges, these roads, in connection with the Boston & Albany, sell at differential rates contrary to agreement.

The "Imperial Limited" through passenger train of the Canadian Pacific, which ran from Montreal to the Pacific Coast in 100 hours, has been discontinued; that is to say, the schedule has been lengthened to the former winter speed, making a difference of about one day in the through time.

According to a correspondent of the New York Journal of Commerce, the aggregate capacity of the grain elevators at Duluth is now 23 million bushels, besides which two million bushels can be stored by the mills. With the new elevators now ordered, or to be built by next year, there will be room for 16 millions more. These elevators are strung along a water front of seven miles. The receipts of grain at Duluth in the year 1898 amounted to 93 million bushels and of flour 6,260,000 barrels. The elevator of the Great Northern Railway holds 3,500,000 bushels, and another, holding three millions, to be built of steel, has been ordered by that company. The Peavey Elevator Company is to have an elevator or storehouse made up of masonry tanks. One of the new elevators at Duluth has cyclone dust collectors which keep the entire building comparatively free from dust. The Canadian Pacific has elevators at Fort William, on the north side of Lake Superior, with a capacity of seven million bushels. Two of the elevators at this point have cylindrical steel storage bins.

### State Regulation of Joint Rates in Iowa.

The case of Blair against the Chicago & Northwestern and the Sioux City & Pacific was decided by the Supreme Court of Iowa this week. These roads established voluntary joint rates in Iowa, and Blair, a shipper, charged the railway companies with discrimination, in that, in many cases, more was charged for a short than for a long haul. The roads admitted it, but claimed that in case the roads voluntarily established joint rates they could not be held liable for the penalties for discrimination. The Supreme Court holds that the promulgation of joint rates makes the two roads, for all traffic purposes, one, subject to all laws against discrimination, and awards Blair a verdict for the unjust charges claimed and triple penalty as exemplary damages.

### Switching and Cartage Regulations in Texas.

The State Railroad Commission of Texas has issued a code of regulations for the guidance of the railroads in stopping grain in transit to be milled; in switching cars of freight for connections or for shippers or consignees, and drayage. Grain may be stopped in transit for cleaning, clipping, sacking, shelling, storing and reconsigning. No charge must be made except that on corn two dollars a car may be charged for switching. Grain stopped for other purposes than the foregoing must be charged according to the tariffs issued by the Commission; the time limit is six months.

The switching rules prescribe a rate of $1.50 per car for distances of one mile and less; two miles, $2; over two miles, $2.50. Where the charge is paid by a connecting railroad the rates shall be the same as those shown in the tariffs now in force.

Section 2 of the order says that "Railroad companies shall not in any case assume, either in whole or in part, the cost of draying freight from or to their depots."

### Chicago Traffic Matters.

Chicago, Oct. 25, 1899.

Interest centers in the absorption of the Wagner Sleeping Car Company by Pullman's. This has been rumored for months, but when the official statement was given out it was a surprise. The absorption will have little effect on the railroads, though there will be one benefit; it will facilitate the interchange of cars. Railroad officers have been many times embarrassed by the clause in the contracts of the sleeping car companies forbidding a road to haul the cars of another company. Where a party desired to use the same sleeping cars over two or more roads using different sleepers railroad superintendents could accommodate only by getting a special dispensation from the managers of the sleeping car company having the upper hand.

The running times of passenger trains between Chicago and Kansas City is to be shortened to 14½ hours. Next Sunday schedules providing for the change will go into effect on nearly all of the roads. The time between these two points has been rather slow for several years past. It was formerly on the fourteen hour basis, but competition brought on a time war that resulted in an agreement to cover the distance in not less than fifteen hours. A change in the time of important eastern connections of the Santa Fe from Chicago, however, forced this road to eliminate one hour and thirteen minutes from its Kansas City-Chicago schedule. The Burlington will cut off fifty-five minutes, and other lines will make similar reductions to bring them down to the fourteen and a half hour schedule. The time between Chicago and Kansas City is not yet on a par with that made to Omaha and St. Paul. There is the usual prospect of trouble over this shortening of schedules. One or two of the long lines, rather than attempt to compete in time, may reduce rates.

Rates on grain to Cincinnati, Columbus, Indianapolis and other interior points will be advanced on Nov. 1, from Chicago to Cincinnati, two cents per 100 lbs.; to Indianapolis, one cent, and to other points in proportion.

The Kansas City, Pittsburg & Gulf has reduced the rates of packing house products to forty-two cents per 100 lbs. from Kansas City to Houston, Galveston and Beaumont. Officers of the Gulf say the reduction is necessary to meet a similar rate formed by a combination via New Orleans.

On Nov. 15 the western roads propose to cancel all special commodity rates.

There is a shortage of coal on nearly all roads running out of Chicago. The immense grain and other traffic has so monopolized the cars of all lines during the past two months that there has been little coal transported.

It is not likely that the executive officers of the western roads at their St. Louis meeting will agree to take any radical action on the pass question. There was a brave proposition to abolish all kinds of free transportation, including exchange annuals and trips, but it is not likely that the time for such drastic action has arrived. The most that will be done, probably, will be to reaffirm the present pass agreement.

Out of nearly 11,000 return tickets to the Chicago festival stamped and sealed by the joint agency of the Central Passenger Association, only 311 remained unclaimed at the close of the office. The value of these uncalled for tickets was $2,261. Of course they are dead now, the limit having expired. These left-over tickets are believed to have been deposited by scalpers who hoped to get them out and sell them before the limit, but evidently they were blocked by the seal and allowed their investment to go by default.